

Index to 1993 *Missouri Epidemiologist*

AIDS

see Sexually Transmitted Diseases

ARTHROPODS

Tick-Borne Disease 1992 (J/O93)

CHRONIC DISEASES

Breast and Cervical Cancer in Elderly (J/F93)
Diabetes and Aging (J/F93)
Radon, Diet and Lung Cancer in Women (M/A93)

COMMUNICABLE DISEASE SUMMARIES

Bi-monthly Morbidity Report (M/A93)
Bi-monthly Morbidity Report (J/F 93) (M/A93)
Bi-Monthly Morbidity Report (M/A93) (M/J93)
Bi-Monthly Morbidity Report (M/J93) (J/O93)
Bi-Monthly Morbidity Report (J/A93) (J/O93)
Communicable Disease 1992 (J/O93)
Communicable and Nosocomial Outbreaks 1992 (J/O93)
Rabies Summary 1992 (J/O93)
Tick-Borne Disease 1992 (J/O93)

COMMUNICABLE DISEASE SURVEILLANCE

Campylobacter in Poultry Workers 1991-93 (M/A93)
Communicable and Nosocomial Outbreaks 1992 (J/O93)
Influenza Isolates in 1992/93 (J/F93)
Tick-Borne Disease 1992 (J/O93)

ENVIRONMENTAL

Diseases and Findings Reportable (J/O93)
EPA Regulations on Pesticide Poisoning (J/O93)
Elevated Nitrate Levels in Private Wells (J/O93)
Legislation for On-Site Sewage (M/A93)
Milk Sanitation Regulation (M/A93)
Radon, Diet and Lung Cancer Risk in Women (M/A93)

LEAD

Carter Responsible for Lead Program (J/F93)
Childhood Lead Poisoning (M/A93)
Keep the Lead in the Can (J/F93)
Lead in School Drinking Water (M/A93)

FOODBORNE ILLNESS

Food Safety Tips (M/A93)
Milk Sanitation Regulation (M/A93)
Rule on Food Handlers (M/A93)

HEPATITIS

Hepatitis A Epidemic in St. Louis (J/F93)
Hepatitis A Incidence 1992 (J/F93)
Universal Infant Hepatitis B Immunization (M/J93)

HIV

see Sexually Transmitted Diseases

IMMUNIZATIONS

Contraindications and Precautions (J/F93) (M/A93)
Requirements for School Attendance (M/A93)
Standards for Pediatric Immunizations (M/A93)
Universal Infant Hepatitis B Immunization (M/J93)
Vaccine-Preventable Diseases 1992 (J/O93)

LEAD

see Environmental

LYME DISEASE

Lyme Disease in Missouri (M/A93)

NOSOCOMIAL INFECTIONS

Basics of Infection Control Conference (M/J93)
Communicable and Nosocomial Outbreaks 1992 (J/O93)
MRSA in Long-Term Care (J/F93)

OCCUPATIONAL

Agriculture is Highest Risk Industry (M/A93)
Charcoal Kilns (M/A93)
Diseases and Findings Reportable (J/O93)
EPA Regulations on Pesticides (J/O93)

OTHER

Child Health Conference (M/J93)
Falls Prevention for elderly (J/F93)
Index 1992 (J/F93)
Office of Rural Health (M/A93)

PERSONNEL

Carter Responsible for Lead Program (J/F93)

Kivlahan Named Health Director (J/F93)

New Managers in Kansas City and St. Louis (J/F93)

Ruggiero is New Bureau Chief (J/O93)

RABIES

Rabies Summary 1992 (J/O93)

SEXUALLY TRANSMITTED DISEASES

New Managers in Kansas City and St. Louis (J/F93)
Sexually Transmitted Diseases 1992 (J/O93)

HIV/AIDS

Bureau of AIDS Prevention 1992 Report (J/O93)
CD4+ Cell Counts Reports Required (M/J93)
Caring for HIV-Infected (M/J93)
Case Definition Expanded (M/J93)
Clinical Trials (M/J93)
Community Action Agencies (M/A93)
Community Based Organizations (M/J93)
Counseling and Testing Reorganized (M/J93)
Counseling and Testing Sites (M/J93)
First Decade of AIDS (M/J93)
Health Education/Risk-Reduction (M/J93)
Information Sources (M/J93)
Kansas City AIDS Research Consortium (M/J93)
Kansas City Becomes Title I (M/J93)
Medications Program (M/J93)
Midwest AIDS Training and Education Center (M/J93)
Physicians Can Help Stop Epidemic (M/J93)
Rural Missouri (M/A93)
St. Louis Becomes Title I (M/J93)
Service Coordination and Client Services (M/J93)
Service Coordination Regions (M/J93)
Speakers Bureau (M/J93)
Statistics June 1993 (M/J93)
Telephone Consultation Service Available (M/J93)
Tutorial for Professionals (M/J93)
Women (M/J93)

SYPHILIS

CDC Treatment Guidelines for Syphilis (J/O93)

Case Definition for Congenital
Syphilis (J/O93)
Syphilis in St. Louis (J/O93)

STATE PUBLIC HEALTH LABORATORY

Laboratory Report (M/A93)
Laboratory Report (J/F, M/A93)
(M/J93)
Laboratory Report (M/J, J/A93)
(J/O93)

TUBERCULOSIS

Anti-Tuberculosis Medication (J/F93)
Homeless Intervention (M/A93)
Multi-drug-Resistant Tuberculosis:
Four-Drug Treatment (M/A93)
Ruggiero is New Bureau Chief
(J/O93)
TB Awareness Fortnight (J/F93)
TB and HIV Infection (M/J93)
Tuberculosis 1992 (J/O93)
Tuberculosis in Elderly (J/F93)

J/F	= January/February
M/A	= March/April
M/J	= May/June
J/A	= July/August
S/O	= September/October
N/D	= November/December

State Public Health Laboratory Report Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Nov. 93	Dec. 93	Total YTD
Specimens Tested	10,095	9,525	118,125
Initial (percent)	65.5%	64.5%	78,351
Repeat (percent)	34.5%	35.5%	39,774
Specimens: Unsatisfactory	130	107	1319
HT Borderline	886	753	8,794
HT Presumptive	54	25	328
PKU Borderline	10	25	219
PKU Presumptive Positive	1	1	14
GAL Borderline	41	25	390
GAL Presumptive Positive	2	0	39
FAS (Sickle cell trait)	85	81	1096
FAC (Hb C trait)	27	24	331
FAX (Hb variant)	23	12	176
FS (Sickle cell disease)	2	2	28
FSC (Sickle C disease)	1	0	23
FC (Hb C disease)	0	0	0

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin,
YTD = Year to Date

New Program To Determine the Number of Allergic Reactions to Flood-Related Mold

by Scott Clardy, Bureau of Environmental Epidemiology

The Missouri Department of Health's Bureau of Environmental Epidemiology will soon implement a disease surveillance system to determine the number of cases of allergic mold reactions in Missouri due to flooding. A case will be defined as any allergic reaction to mold, including sinusitis, allergic rhinitis, conjunctivitis, asthma and dermatitis. The mold can be the result of the 1993 flood or of flooding in 1994.

The bureau is seeking to obtain the prevalence rate of these conditions for several reasons. First, we want to as-

sure proper environmental follow-up, such as appropriate disinfecting and cleaning. Second, we want to establish that patients are obtaining appropriate care for their condition. In addition, if the prevalence of flood-related allergies is significantly high, we will have cause to seek funding so that more extensive assistance may be provided. With the help of this surveillance activity we will be able to characterize those areas most affected by mold from flooding and then develop appropriate plans for the future.

We will conduct active surveillance of selected allergists and pulmonary physicians located in flood-prone areas and/or those who are likely to get referrals from such areas. We will phone these physicians to establish a contact person in each office then conduct a bi-weekly follow-up to obtain the number of cases seen in that office for the previous two weeks. We will also ask for demographic data for each case reported. Any physicians not contacted by phone, but seeing conditions which fit the case definition, are urged to report them to Scott Clardy or Daryl Roberts at (800) 392-7245.



Missouri

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Dr. Coleen Kivlahan Named State Health Director

Coleen Kivlahan, M.D., M.S.P.H., became the director of the Missouri Department of Health on February 22, 1993. Dr. Kivlahan was appointed to the post by Governor Mel Carnahan, and was subsequently confirmed by the Missouri Senate. Dr. Kivlahan is the third permanent director since the department was created in 1985.

Dr. Kivlahan brings a wealth of experience in family practice and public health to the department. After receiving her undergraduate degree from St. Louis University and her medical degree from the Medical College of Ohio at Toledo, she completed her internship and residency at the University of Missouri Medical Center. Dr. Kivlahan then became medical director at the Columbia/Boone County Health Department, where she delivered public health, primary and preventive services.

In 1987, Dr. Kivlahan joined the Missouri Department of Health as medical director of the Division of Maternal, Child and Family Health. During her two years at the department, Dr. Kivlahan was instrumental in improving the quality of care in local prenatal clinics, expanding the number of physicians and nurse practitioners in local health departments, providing medical consultation on environmental health issues and improving the state's childhood-vaccine delivery system.

Dr. Kivlahan served as medical director of the Missouri Department of Social Services from 1989 until 1993, where

she devoted most of her time developing and training a network of physicians to assure high-quality examinations for victims of abuse, researching child deaths, and expanding medical services provided under Medicaid. Her child-death research led her to propose and develop a system of investigating child deaths that has become a model for the nation.

During this period, she worked for a brief time in Washington, D.C., as medical director of the Health Resources and Services Administration, where she focused primarily on maternal and child health issues.

Dr. Kivlahan also recognized the great need for services for the uninsured or underinsured, and persuaded Columbia's three local hospitals and the local United Way to help set up the Boone County Family Health Center. Since the clinic opened last June, Dr. Kivlahan has worked in a joint practice with nurses and nurse practitioners providing primary and preventive care to low-income families. Dr. Kivlahan plans to continue working at the health center.

Dr. Kivlahan's proposed priorities for the department include: increase the knowledge of the general public about public health; increase access to primary/preventive services for Missourians; further expand the constituency of the Department of Health to include academia, business and health-care professionals; and form partnerships with the media to help reach the department's goals.



Dr. Kivlahan and her husband, Dr. Bernard Ewigman, collaborate on medical research, as well as serve as co-medical directors of the Boone County Family Health Center. They have two children, Kevin, 13, and Nathan, 8.

Inside this Issue...

Page	
2	Diabetes and Aging
4	Plan for Falls Prevention
8	Contraindications and Precautions to Immunizations
11	1992 Index
13	Hepatitis A Epidemic in St. Louis
14	1992 Hepatitis Incidence in Missouri
15	1992/93 Influenza Update

Diabetes and Aging

A. Neal Sprick, A.B.
Patrick O. Akinbola, Ph.D.
Bureau of High Risk Intervention

Diabetes is a leading cause of death and disability in Missouri. The Centers for Disease Control and Prevention (CDC) estimates that more than 300,000 Missourians have diabetes, although only about half are diagnosed¹. Diabetes was the seventh leading cause of death in Missouri in 1991, being reported as an underlying cause for 1,106 resident deaths and as a contributing cause for an additional 2,600 deaths². CDC estimates that more than 62,000 hospitalizations in Missouri each year are due to diabetes, and that the financial cost of the diabetes problem in the state is about \$450 million in direct (medical care) and indirect (lost productivity) costs¹.

While persons of all ages can develop diabetes, the prevalence of the disease increases significantly with age. The two major types of diabetes are insulin-dependent diabetes mellitus (IDDM) and non-insulin-dependent diabetes mellitus (NIDDM). Elderly persons are more likely to have NIDDM, the type of diabetes that accounts for approximately 90 to 95 percent of the cases in the United States. The American Diabetes Association estimates that about half of all diabetes cases are among persons over 55 years of age³. More than 77 percent of the Missouri resident deaths caused by diabetes in 1991 were among persons over the age of 65².

Cardiovascular disease is the most frequent cause of death for diabetic persons, as it is for the rest of the population; however, the annual risk for death from cardiovascular disease is two to three times greater for persons with diabetes⁴. Approximately 1,000 lower-extremity amputations are performed each year in Missouri because of diabetes, and there are about 315 new cases of diabetes-related blindness and 165 cases of diabetic end-stage renal disease¹. Persons with IDDM are at greatest risk for all complications of diabetes, but per-

sons with NIDDM are also at high risk and because of the higher numbers of NIDDM cases account for most of the morbidity and mortality.

In addition to the public and private financial burden resulting from these problems, the disabilities and restrictions to lifestyle that accompany diabetes can greatly reduce quality of life for diabetic persons and their families. The prevalence of diabetes and other risk factors that contribute to the complications of diabetes are of great concern to the state's public health community.

The Missouri Department of Health conducts Behavioral Risk Factor Surveillance System (BRFSS) interviews that include questions about diabetes and risk factors that contribute to diabetic complications. The BRFSS data are an important source of information about the prevalence of diabetes in the state. Persons participating in BRFSS during the years 1988 through 1991 were asked whether they had ever been told by a doctor that they had diabetes. In 5,898 interviews completed during those years, 5,880 respondents answered the diabetes question with 323 (5.5%) answering "yes."

The fact that diabetes prevalence increases with age is demonstrated in several ways in the Missouri BRFSS data. Figure 1 compares the percentages of diabetic respondents in three age groupings. Diabetic respondents had a median age of 64 years, while nondiabetic respondents had a median age of 41 years. Among the diabetic respondents, 49 percent were age 65 and older, compared to 20 percent of the nondiabetic respondents.

As Missouri's population ages, the prevalence of diabetes and diabetic complications will almost certainly increase. The key to preventing excessive morbidity and mortality due to diabetes is to eliminate or reduce certain health risk factors for diabetic complications. The American Diabetes Association maintains that half of all NIDDM cases and at least half of most major complications of diabetes could be prevented by appropriate education and intervention programs. Improved patient education can help diabetic persons to control obesity, reduce cholesterol levels, exercise, stop smoking and improve control of blood-glucose levels³. Early application of currently available clinical measures to prevent, detect and treat diabetic complica-

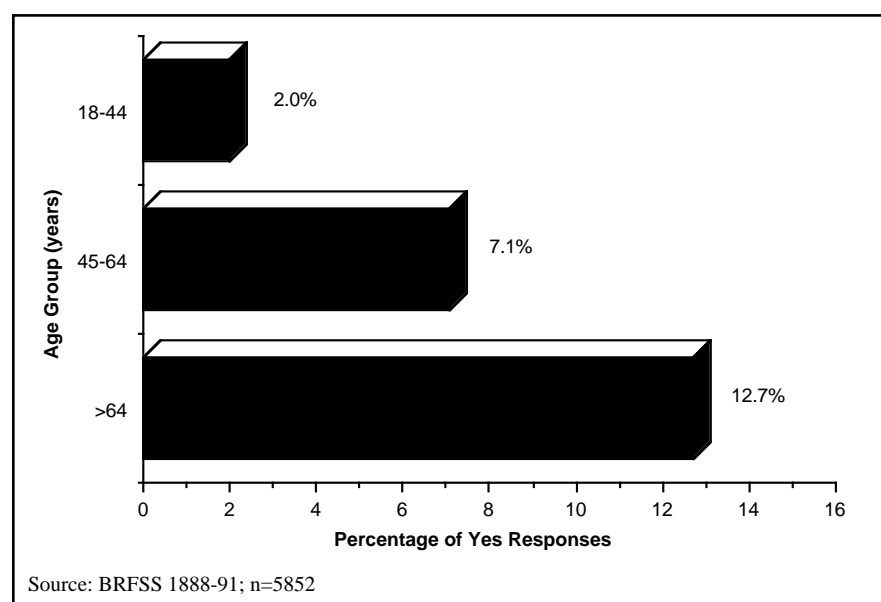


Figure 1. Prevalence of self-reported diabetes among adults by age group, Missouri, 1988-91.

tions may reduce the incidence or severity of those complications if systematically applied⁴.

The Missouri Diabetes Control Program (MDCP) assists health-care providers to obtain and translate findings of diabetes research into regular patient care and education. Through a cooperative agreement with the CDC Division of Diabetes Translation, the MDCP disseminates guidelines and recommendations based on the best current knowledge of diabetes management. The MDCP also assists health-care providers, especially those serving high-risk and underserved populations, to implement interventions to reduce the risk of diabetic complications.

An important part of the MDCP effort is the distribution of *The Prevention and Treatment of Complications of Diabetes: A Guide for Primary Care Practitioners*, which was developed by the CDC to help in the day-to-day management of patients with diabetes and to help prevent, detect and treat the major complications of diabetes. This guide and additional information about the MDCP or the prevention and treatment of diabetic complications can be obtained from the Missouri Diabetes Control Program at (314) 876-3265.

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State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Sep 92	Oct 92	Total YTD
Specimens Tested	10,550	9,859	97,829
Initial (percent)	69.8%	67.1%	66,962
Repeat (percent)	30.2%	32.9%	30,867
Specimens: Unsatisfactory	116	92	1,155
HT Borderline	555	532	4,899
HT Presumptive	17	15	177
PKU Borderline	23	21	193
PKU Presumptive Positive	1	1	7
GAL Borderline	59	30	427
GAL Presumptive Positive	3	3	24
FAS (Sickle cell trait)	119	100	983
FAC (Hb C trait)	37	15	260
FAX (Hb variant)	16	18	173
FS (Sickle cell disease)	3	1	30
FSC (Sickle C disease)	1	3	15
FC (Hb C disease)	0	1	7

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Tuberculosis Remains a Concern for the Elderly

*Arlon Meyer, M.P.H.
Bureau of Tuberculosis Control*

The number and percentage of active cases of tuberculosis occurring among the elderly in Missouri decreased last year. In 1992, 37.1 percent (91/245) of the tuberculosis cases occurred among individuals age 65 and over. This is in comparison to 46.5 percent (118/254) of the cases that occurred among the elderly in 1991.

The main reason for tuberculosis in the elderly most likely is that they were infected at some time earlier in life when preventive therapy was not a common

practice. As a person grows older, their immunity "waned," resulting in these infected persons developing active tuberculosis.

Possible reasons for not seeing increasing cases in the elderly are increased awareness and surveillance and the placing of exposed persons on preventive therapy.

The issue of tuberculosis in the elderly will be explored in more detail in a future issue of the *Missouri Epidemiologist*.

Missouri Plan for Falls Prevention—Focus on Older Adults

Patti Van Tuinen, M.Ed., C.H.E.S.
Cherie Crowe, M.A.
Office of Injury Control

Like other midwestern states, Missouri has a large proportion of its population in the 65 and older category¹. Health-care needs of the elderly are a major concern in this state and prevention of unnecessary injuries is high on the list of health priorities for older Missourians. The Falls Study Group, part of the Missouri Injury Control Advisory Committee to the Missouri Department of Health's Office of Injury Control, has produced the *Missouri Plan for Falls Prevention* to address a leading cause of death and disabling injury among older Missourians.

Falls are the second leading cause of all unintentional injury deaths for Missourians of all ages. See Figure 1.

Adults over the age of 65 are most at risk from dying or suffering severe, long-term effects from injuries due to falls. During 1979–1988, 81 percent of all Missouri deaths from falls occurred to persons 65 years of age and over². See Figure 2. Fall-related death rates among those 65 years of age and older are 10 to 150 times higher than those in younger age groups¹.

More Missourians are hospitalized for falls than for any other injury³. See Figure 3. The elderly and young children are populations most at risk. These hospitalizations are a major source of health-care cost. In addition, for the elderly, the severity of injuries combined with extended recovery periods makes falls and fall-related injuries a particularly serious threat to health and ability to function. Missouri's youngest and oldest are at greatest risk for head and spinal cord injuries due to falls. See Figure 4.

Falls should not be accepted as an inevitable and normal consequence of aging. Most falls are not random, unpredictable events. Researchers agree that un-

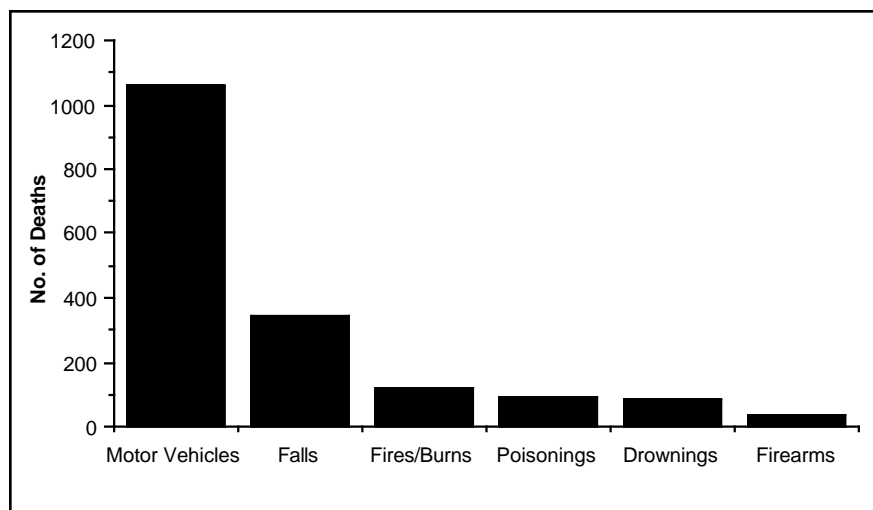


Figure 1. Unintentional injury deaths by cause, Missouri, 1989-90

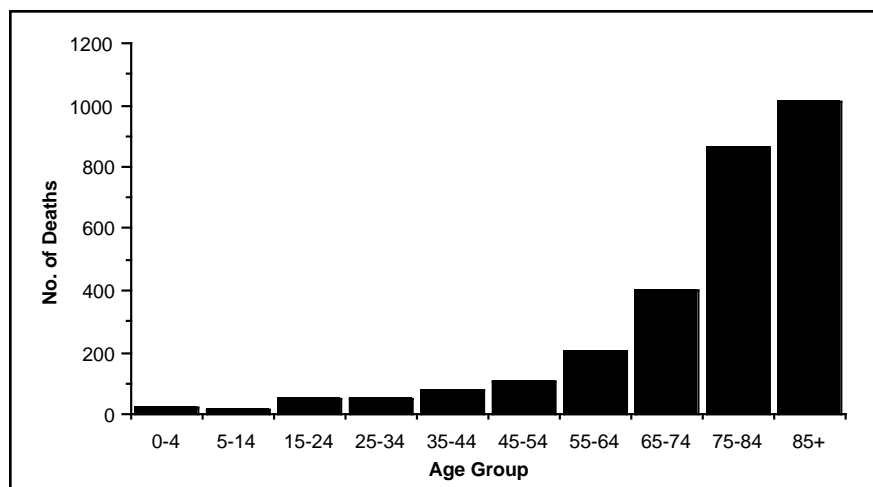


Figure 2. Deaths from falls by age group, Missouri, 1979-88

derstanding the risk factors associated with falls is the initial step in devising strategies to prevent falls.

The risk factors relating to falls can be divided into two major categories: internal (intrinsic/host) and external (extrinsic/environmental)^{4,5}.

Internal risk factors for falls include:

- physiological changes due to aging
- impact of disease, illness, injury or changing life situation
- impairment of balance due to a variety of conditions and diseases that can affect body alignment, awareness of orientation in space, gait, strength and/or coordination

- diminished physical condition
- diminished mental health

External risk factors for falls include:

- factors relating to the community such as uneven or icy surfaces on sidewalks, curbs and streets
- factors relating to the place of residence such as poor lighting, loose rugs or other slippery floor surfaces, dangerous stairs, and inappropriate clothing
- factors relating to management of care, including poorly designed or fitted assisting devices (canes, walkers, wheelchairs)
- use of medications that can hamper sense of balance and coordination

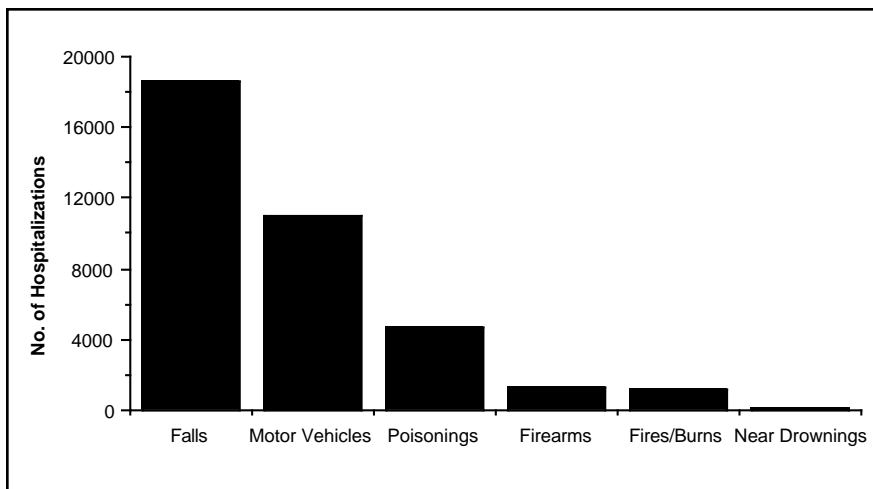


Figure 3. Estimated injury-related hospitalizations by cause, Missouri, 1990

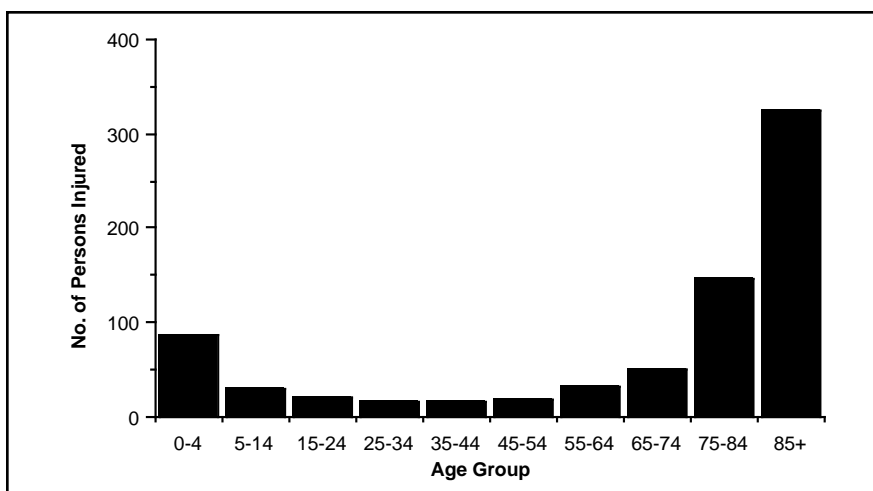


Figure 4. Rate of head and spinal cord injuries per 100,000 population due to falls by age group, Missouri, 1987-89

Because of the high risk of falls in the elderly population and because of the high cost, both human and financial, of fall-related injury, the Falls Study Group has made the following recommendations:

Professional Education

Establish a system to provide professional-education programs focusing on the prevention of falls among older adults.

Public Awareness

Increase public awareness and education about the significance of falls as a public health problem among older adults and promote the use of falls-prevention strategies.

Data/Research

- Establish a system for collecting and analyzing data on hospitalizations and nursing home care related to falls among the elderly.
- Provide opportunities for Missouri falls researchers to share research findings, study statewide data and develop promising interventions worthy of replication throughout the state.

To achieve the recommendations set forth, the Department of Health will involve other state agencies including the Department of Social Services and the Division of Aging, as well as university researchers, service-delivery systems, state professional associations, and other organizations concerned about the health and well being of older adults.

The Office of Injury Control currently is working with the Falls Study Group to ensure implementation of these recommendations. If you are interested in this effort or would like a free copy of the *Missouri Plan for Falls Prevention*, please contact the Office of Injury Control at (314) 751-6365.

This article is a summary of the Missouri Plan for Falls Prevention developed by the Missouri Injury Control Advisory Committee Falls Study Group. Authors include: Study Group Chair, Joanne Polowy, M.S.W., Division of Aging; R. Dale Findlay, Missouri Safety Council; Alice F. Kuehn, Ph.D., R.N., C., University of Missouri-Columbia/School of Nursing; Sheila Larkin, Missouri Department of Social Services; Gloria Metzger, R.N., Missouri Hospital Association; Jerald Miller, Safety Council of Greater St. Louis; John E. Morley, M.B., B.Ch., St. Louis University Medical Center/School of Medicine; Susan Vaughn, Missouri Head Injury Advisory Council; Andrew Silver, M.D., St. Louis University Medical Center/School of Medicine; Kathy Zents, Safety & Health Council of Western Missouri & Kansas; and staff from the Missouri Department of Health, Division of Health Resources: Mark Van Tuinen, Ph.D., Bureau of Health Services Statistics and Patti Van Tuinen, M.Ed., C.H.E.S., Office of Injury Control.

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Breast and Cervical Cancer and the Elderly

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Robin Jones

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Bureau of Smoking, Tobacco and Cancer

Podolsky and Silberner report in the Jan. 18 issue of *U. S. News and World Report* that "in the past 15 years, the cancer death rate has dropped five percent for people 65 and younger—and risen 13 percent for those over 65."¹ An increasing number of elderly women are developing and dying from breast and cervical cancers. Research has demonstrated that breast and cervical cancers are the leading causes of preventable cancer deaths among elderly women in the United States². Data gathered by the Missouri Cancer Registry of the Missouri Department of Health reflects the gravity of these diseases on elderly women of Missouri.

Between 1986 and 1991, 48 percent of all cases of breast cancer occurred in women aged 65 or older and 59 percent of all the deaths from breast cancer occurred in women aged 65 or older. See Table 1. Twelve percent of all cases of cervical cancer occurred in women aged 65 or older and 43 percent of all the deaths related to cervical cancer occurred in women aged 65 or older. See Table 2. Mortality rates from both breast and cervical cancers are highest among women 65 years of age and older. Thus, it is clear from the data that a disproportionate number of elderly women develop and die from breast and cervical cancers. In addition, being elderly and an ethnic minority puts women at an even greater risk of developing and dying from both breast and cervical cancers.

The Missouri Department of Health, in conjunction with the Centers for Disease Control and Prevention and the Missouri Division of the American Cancer Society, are providing free breast and cervical cancer screenings to economically disadvantaged women. Because of the disproportionate numbers

Table 1. Breast Cancer by Age and Race, Missouri, 1986–1991

Breast Cancer Incidence by Age and Race in Missouri Women			
<u>Age</u>	<u>White</u>	<u>Black</u>	<u>Total</u>
Younger than 39 years	1,155 (6.6%)	148 (10.8%)	1,339 (7.0%)
40-64 years	7,717 (44.1%)	701 (51.0%)	8,613 (44.7%)
65 years or older	8,634 (49.3%)	525 (38.2%)	9,366 (48.3%)
Total	17,506 (90.6%)	1,374 (7.1%)	19,318 (100%)

Breast Cancer Deaths by Age and Race in Missouri Women			
<u>Age</u>	<u>White</u>	<u>Black</u>	<u>Total</u>
Younger than 39 years	191 (3.7%)	22 (4.1%)	216 (3.8%)
40-64 years	1,841 (35.6%)	274 (51.6%)	2,122 (37.1%)
65 years or older	3,139 (60.7%)	235 (44.3%)	3,382 (59.1%)
Total	5,171 (90.4%)	531 (9.3%)	5,720 (100%)

Source: DOH, Missouri Cancer Registry, 1993

Table 2. Cervical Cancer by Age and Race, Missouri, 1986–1991

Cervical Cancer Incidence by Age and Race in Missouri Women			
<u>Age</u>	<u>White</u>	<u>Black</u>	<u>Total</u>
Younger than 39 years	2,546 (59.6%)	401 (57.5%)	3,042 (59.3%)
40-64 years	1,212 (28.4%)	206 (29.5%)	1,472 (28.7%)
65 years or older	513 (12.0%)	91 (13.0%)	617 (12.0%)
Total	4,271 (83.2%)	698 (13.6%)	5,131 (100%)

Cervical Cancer Deaths by Age and Race in Missouri Women			
<u>Age</u>	<u>White</u>	<u>Black</u>	<u>Total</u>
Younger than 39 years	69 (14.9%)	13 (12.3%)	83 (14.5%)
40-64 years	188 (40.6%)	51 (48.1%)	242 (42.2%)
65 years or older	206 (44.5%)	42 (39.6%)	248 (43.3%)
Total	463 (80.8%)	106 (18.5%)	573 (100%)

Source: DOH, Missouri Cancer Registry, 1993

of elderly women in Missouri who are economically disadvantaged³, the Missouri Breast and Cervical Cancer Control Project (BCCCCP) is dedicated to ensuring that elderly women are a priority in receiving these services.

While there is direct evidence that demonstrates the efficacy of mammography in women 50-74 years of age, some controversy exists regarding the efficacy of mammography in women 75 years of age and older⁴. In her review of the

literature, Dr. Mary Costanza, professor of medicine at University of Massachusetts Medical School, concluded that the efficacy of mammography in women 75 years of age and older is obscured by problems of other diseases. Despite this controversy, it is the mission of the BCCCP to remove cost as a barrier for elderly women in obtaining breast cancer screenings.

In addition to cost, there are several other barriers that preclude elderly women from receiving preventive health care. Those barriers include social factors (e.g. isolation), psychological functioning (e.g. depression) and cultural mores⁵. These barriers represent a challenge to the BCCCP staff in reaching the elderly women of Missouri. For example, many elderly women are not aware of the advanced methods for treating breast cancer such as lumpectomies, radiation therapy and/or chemotherapies. Elderly women might still believe that the disfiguring radical mastectomy procedure of 15 years ago is their only option for treatment if breast cancer is detected. Dr. William Ershier, director of the University of Wisconsin Institute on Aging, suggests the elderly may respond better to treatment of breast cancer because such tumors seem to be less aggressive in elderly women¹.

Regarding cervical cancer screenings in elderly women, a common misconception is that if an elderly woman is not currently sexually active there is no need to get a Pap test. While some controversy exists about this issue, Dr. Steven H. Woolf, a member of the Canadian Task Force on the Periodic Health Examination, states that "Many older women have had inadequate screening . . . nearly half of women over the age of 65 have never received a Pap test, and 75 percent have not received regular screening." Woolf concludes that "Further screening in this group of older women is important . . ."⁶

Because of the many issues that might inhibit or prevent elderly women from

obtaining the free services provided by the BCCCP, innovative strategies are being employed to reach these women. For example, the BCCCP staff is working closely with several organizations to develop literature that addresses issues specific to elderly and ethnic minority women regarding the importance of breast and cervical cancer screening.

In addition, efforts are underway, with the help of several Hispanic women, to ensure that the educational materials on breast and cervical cancer screening are translated into Spanish.

Finally, consistent with the most current data on the relationship between adherence and preventive health-care behaviors⁷, it is the philosophy of the BCCCP staff to utilize methods of integrating preventive health-care services into women's lives rather than impinging them upon their lives.

Women 40 years of age or older are eligible for free breast-cancer screening through the BCCCP, while women 18 years of age or older are eligible for cervical-cancer screening through the BCCCP. All the women must live in homes in which the annual income does not exceed 200 percent of the federal poverty guidelines. For example, a woman who lives in a four-member family with a total family income of \$27,900 or below would be eligible for these services. Although Medicare reimburses for mammograms every other year for women 65 years and older, the project will pay for these services on alternate years.

The majority of the screenings will take place at federally funded community health clinics, local health departments, non-profit primary care health facilities and public hospitals throughout the state of Missouri. Currently, both breast and cervical cancer screenings are taking place at the Boone County Family Health Center in Columbia, Samuel U. Rodgers Health Center in Kansas City, Pettis County Community Health Center in Sedalia and at St. Louis Regional Medi-

cal Center in St. Louis. Spelman/St. Luke's Hospital in Kansas City and Spelman Memorial Hospital in Smithville are only doing breast-cancer screenings. The Audrain City-County Health Unit in Mexico and the Randolph County Health Department in Moberly are doing only cervical-cancer screenings. The number of sites contracted to provide services will continue to increase until screenings are offered statewide. The screenings will continue for five years. During this time, it is projected over 20,000 women in the state of Missouri will be screened annually.

The BCCCP staff are available to answer any questions regarding the free screenings and they encourage you to contact them at (314) 876-3273 for more information.

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Contraindications and Precautions to Immunizations

The 1992 Missouri Retrospective Immunization Survey conducted by the Department of Health's Bureau of Immunization revealed that only 44 percent of Missouri children are appropriately immunized by their second birthdays. These low immunization levels are in part due to current health-care practices that often result in the failure to administer vaccines on schedule. The use of invalid contraindications will often needlessly delay the administration of indicated immunizations.

The following chart provides a listing of the true contraindications and precautions to immunizations as well as a listing of conditions often mistaken for contraindications to immunizations. This guide was published by the National Vaccine Advisory Committee (NVAC) in the document *Standards for Pediatric Immunization Practices*.

GUIDE TO CONTRAINDICATIONS AND PRECAUTIONS TO IMMUNIZATIONS		
Vaccine	True Contraindications and Precautions	
GENERAL FOR ALL VACCINES DTP/DTaP OPV IPV MMR Hib HBV	Anaphylactic reaction to a vaccine contraindicates further doses of that vaccine	Mild to moderate local reaction (soreness, redness, swelling) following a dose of an injectable antigen
	Anaphylactic reaction to a vaccine constituent contraindicates the use of vaccines containing that substance	
	Moderate or severe illnesses with or without a fever	Mild acute illness with or without low-grade fever
		Current antimicrobial therapy
		Convalescent phase of illnesses
		Prematurity (same dosage and indications as for normal, full-term infants)
		Recent exposure to an infectious disease
		History of penicillin or other nonspecific allergies or fact that relatives have such allergies
DTP/DTaP	Encephalopathy within 7 days of administration of previous dose of DTP	
	Precautions*	Temperature of <40.5° C (105° F) following a previous dose of DTP
		Family history of convulsions**
		Family history of sudden infant death syndrome
		Family history of an adverse event following DTP administration
	Collapse or shock-like state (hypotonic-hyporesponsive episode) within 48 hours of receiving a prior dose of DTP Seizures within 3 days of receiving a prior dose of DTP Persistent, inconsolable crying lasting ≥3 hours, within 48 hours of receiving a prior dose of DTP	

GUIDE TO CONTRAINDICATIONS AND PRECAUTIONS TO IMMUNIZATIONS

Vaccine	True Contraindications and Precautions		Not True (Vaccines may be given)
OPV***	Infection with HIV or a household contact with HIV		Breastfeeding
	Known altered immunodeficiency (hematologic and solid tumors; congenital immunodeficiency; and long term immunosuppressive therapy)		Current antimicrobial therapy
	Immunodeficient household contact		Diarrhea
	Precaution*	Pregnancy	
IPV	Anaphylactic reaction to Neomycin or Streptomycin		
	Precaution*	Pregnancy	
MMR***	Anaphylactic reactions to egg ingestion and to Neomycin		Tuberculosis or Positive PPD
	Pregnancy		Simultaneous TB skin testing****
	Known altered immunodeficiency (hematologic and solid tumors; congenital immunodeficiency; and long term immunosuppressive therapy)		Breastfeeding
			Pregnancy of mother of recipient
	Precaution*	Recent (within 3 months) IG administration	Immunodeficient family member or household contact
			Infection with HIV
			Non-anaphylactic reactions to eggs or Neomycin
Hib			
HBV			Pregnancy

*The events or conditions listed as precautions, although not contraindications, should be carefully reviewed. The benefits and risks of administering a specific vaccine to an individual under the circumstances should be considered. If the risks are believed to outweigh the benefits, the immunization should be withheld; if the benefits are believed to outweigh the risks (for example, during an outbreak or foreign travel), the immunization should be given. Whether and when to administer DTP to children with proven or suspected underlying neurologic disorders should be decided on an individual basis. It is prudent on theoretical grounds to avoid vaccinating pregnant women. However, if immediate protection against poliomyelitis is needed, OPV, not IPV, is recommended.

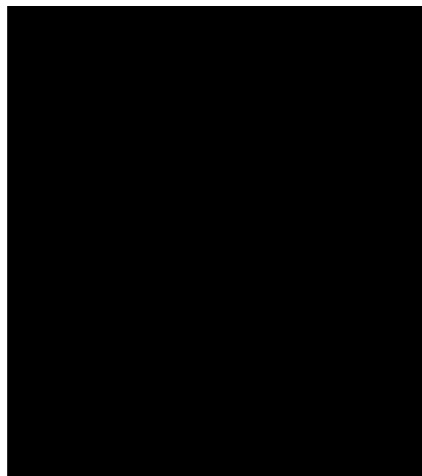
**Acetaminophen given prior to administering DTP and thereafter every 4 hours for 24 hours should be considered for children with a personal or with a family history of convulsions in siblings or parents.

***There is a theoretical risk that the administration of multiple live virus vaccines (OPV & MMR) within 30 days of one another if not given on the same day will result in a suboptimal immune response. There are no data to substantiate this.

****Measles vaccination may temporarily suppress tuberculin reactivity. If testing can not be done the day of MMR vaccination, the test should be postponed for 4-6 weeks.

This information is based on the recommendations of the Immunization Practices Advisory Committee (ACIP), the Committee on Infectious Diseases (Red Book Committee) of the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP). For more detailed information, please consult the published recommendations of the ACIP, the AAP, the AAFP or contact the Bureau of Immunization at (314) 751-6133.

Michael Carter Responsible for Lead Programming



Michael Carter, a graduate student from the University of Missouri MHA program, has been appointed to a position temporarily assigned as a project specialist to coordinate, develop and establish a lead program in the Division of Environmental Health and Epidemiology. He will work initially under the direction of William Schmidt, division director. His responsibilities include drafting Missouri's 1993 application for

the CDC Childhood Lead Poisoning Prevention Grant Program, serving as liaison with federal agencies and other state and local agencies on lead poisoning issues and acting as Department of Health point of contact for lead.

Mike's undergraduate education included a Baccalaureate in Arts from St. Louis University in 1978 with a major in Biology and minor in Chemistry. He served in the U.S. Navy as a line officer and information officer for four years and has reached the rank of Lieutenant Commander in the Naval Reserves.

He has also had several years of experience as a research laboratory technician, most recently with University of Missouri School of Veterinary Medicine. This past summer Mike had an internship with the Department of Health. He has completed classroom work and expects to graduate with the MHA in May 1993.

Mike and his family live in Columbia.

Keep the Lead in The Can

Richard Gnaedinger, Ph. D.
Bureau of Environmental Epidemiology

If we could only scoop up all the lead that has been dispersed into the environment over the years, put it in cans and keep it there, we would have solved, or at least have controlled, one of the world's major preventable health problems, lead poisoning.

Scooping up all the lead unfortunately would take longer than it took to disperse it, but we can do something about stopping this cycle now simply by not letting the lead out of the can in the first place.

Such was the case involving an incident that came to our attention here in Jefferson City just recently. It seems that this particular school wanted to paint

stripes on its playground with yellow, white and blue lead-based paint, the kind used by the highway department to stripe highways and parking lots. The school logically concluded that if it is durable enough for automobile traffic, it is certainly durable enough for school traffic. What made the use of this paint even more attractive in this case was the fact that the school got it free of charge as a donation.

Luckily the environmentally conscious school PTO board saw the problem with using this paint, which would result in spreading more lead around the environment, not to mention the potential hazard that this would pose to the health of the children. The school acted prudently in this case and we commend their decision to keep the lead in the can.

Document Addresses Prevention and Control of MRSA in Long-Term Care Facilities

Caryl Collier, R.N., M.P.H., C.I.C.
Bureau of Communicable Disease Control

From March 1 to September 17, 1991, four meetings were held by a statewide committee whose primary objective was to develop a consensus on the prevention and management of methicillin resistant *Staphylococcus aureus* (MRSA) in long-term care facilities. The committee had representation from the long-term care industry, Missouri Division of Aging, four Missouri chapters of the Association for Practitioners in Infection Control, Missouri Hospital Association, University of Missouri Hospital and Clinics, infectious disease specialists and the Missouri Department of Health (State Health Laboratory, Office of Epidemiology and Bureau of Communicable Disease Control).

The committee developed a document entitled, *Infection Control in Long-Term Care Facilities with an Emphasis on Body Substance Precautions*. This document has been distributed to all nursing homes, to all long-term care units in hospitals, to state-affiliated mental health facilities and to district and county health units. Because there have been a number of additional copies requested by individuals, the document is being made available for \$2.50 each plus \$2.50 postage and handling per order from the Bureau of Communicable Disease Control. Interested persons may call (314) 751-6115 or write:

**Missouri Department of Health
Bureau of Communicable
Disease Control
P.O. Box 570
Jefferson City, Missouri 65102**

1992 Index to *Missouri Epidemiologist*

ARTHROPODS

- Ehrlichiosis
 - annual summary 1991 J/S92
- Lyme disease
 - (see LYME DISEASE)
- Rocky Mountain spotted fever
 - annual summary 1991 J/S92
- Tick-borne disease
 - annual summary 1991 J/S92
- Tularemia
 - annual summary 1991 J/S92

CHOLERA

- Teaching materials M/A92
- Updates J/F92,M/J92

COMMUNICABLE DISEASE

SUMMARIES

- Annual summary 1991 J/S92
- Outbreak summary 1991 J/S92
- 15 year report J/S92

COMMUNICABLE DISEASE

SURVEILLANCE

- Communicable disease
 - coordinators J/F92
- E. coli* O157:H7
 - now reportable J/F92,M/J92
- Group B streptococcus
 - bacteriuria in Missouri O/D92
- Special surveillance for
 - invasive bacterial diseases J/F92
- National electronic system
 - for surveillance (NETSS) M/A92
- Reporting hotline J/S92

DIARRHEAL ILLNESS

- E. coli* O157:H7
 - now reportable J/F92,M/J92
- Enteric diseases
 - annual summary 1991 J/S92
- Food safety costs O/D92
- Foodborne outbreaks associated
 - with catered meals O/D92
- Food preparation regulations O/D92
- Gastrointestinal illness
 - related to birthday party O/D92
 - related to catered meals O/D92
 - related to golf tournament O/D92
 - related to leftovers O/D92
- Outbreak associated with
 - dunking booth M/A92

- Salmonella braenderup* at
 - holiday party O/D92
- Salmonella infantis* associated
 - with wedding J/F92,O/D82
- Salmonella muenchen*
 - at barbecue O/D92
- Shigellosis
 - increase in 1992 J/S92

ENVIRONMENTAL

- Bureau of Environmental
 - Epidemiology
 - 1992 report J/S92
- Community sanitation
 - new bureau chief M/J92
- Cremation authorization J/F92
- Dioxin hotline J/S92
- Missouri fatal accident circumstances
 - and epidemiology (MOFACE) M/A92,O/D92
- Ice survey—Missouri 1990 J/F92
- Lead in school drinking water J/F92
- Radon
 - awareness in Missouri M/J92
 - concentrations in
 - Missouri schools J/F92
 - hotline J/S92
 - risk levels M/J92

FOODBORNE ILLNESS

- Ciguatera poisoning linked to
 - Florida Amberjack J/F92
- E. coli* O157:H7
 - now reportable J/F92,M/J92
- Enteric diseases
 - annual summary 1991 J/S92
- Food safety costs O/D92
- Foodborne outbreaks associated
 - with catered meals O/D92
- Food preparation regulations O/D92
- Gastrointestinal illness
 - related to birthday party O/D92
 - related to catered meals O/D92
 - related to golf tournament O/D92
 - related to leftovers O/D92
- Hepatotoxicity associated
 - with chaparral O/D92
- Outbreak associated with
 - dunking booth M/A92
- Salmonella braenderup* at
 - holiday party O/D92
- Salmonella infantis* associated
 - with wedding J/F92,O/D82

- Salmonella muenchen*
 - at barbecue O/D92
- Scombroid fish poisoning
 - in Atlanta O/D92

HEPATITIS

- Annual summary 1991 J/S92
- Hepatitis A
 - epidemic in Missouri 1992 O/D92
 - immune globulin
 - recommendations M/J92
 - trends in Missouri 1991 J/F92
 - trends in Missouri 1992 J/S92
 - waterborne associated with
 - church and school O/D92
- Hepatitis B universal
 - vaccination M/J92
- Hepatotoxicity associated
 - with chaparral O/D92

HOTLINES/PHONE NUMBERS

- AIDS hotline J/S92
- CDC voice information on
 - nosocomial infections M/J92
- Communicable disease J/S92
- Dioxin J/S92
- Radon J/S92

IMMUNIZATION/VACCINE

PREVENTABLE DISEASE

- Annual summary 1991 J/S92
- Haemophilus influenzae*
 - annual summary 1991 J/S92
 - special surveillance for
 - vaccine for child
 - care attendees J/F92
- Immunization action plan M/J92
- Incidence in preschool
 - age population J/F92
- Influenza/pneumonia
 - immunization
 - recommendations O/D92
 - summary 1991-92 season M/J92
- Mumps added as requirement
 - for school attendance O/D92
- Polio threat 1992 O/D92
- School immunization
 - law changes O/D92
- Vaccine information pamphlets J/F92

LONG RANGE PLANNING

- Department of health strategic plan
 - for year 2000 M/A92,O/D92

LYME DISEASE

Erythema migrans rash investigation in Missouri	M/J92
Lyme disease investigation in southeast Missouri	J/F92
Malariotherapy for	J/F92
Serology update	M/A92

MALARIA

Malariotherapy for Lyme Disease	J/F92
---------------------------------	-------

MYCOBACTERIA/ TUBERCULOSIS

Drugs for mycobacteria	M/J92
Tuberculosis	
annual summary 1991	J/S92
awareness	J/F92
drug resistant incidence in Missouri	M/J92
elimination	M/J92
incidence in Missouri schools	M/A92
para-aminosalicylic acid availability	M/A92,M/J92
pre-admission testing for nursing home residents	O/D92
streptomycin alternatives	M/J92
streptomycin	
availability	M/A92,M/J92
walk/run	M/J92

NOSOCOMIAL INFECTIONS

CDC voice information on nosocomial infections	M/J92
Group B streptococcus bacteriuria in Missouri	O/D92
Special surveillance for invasive bacterial diseases	J/F92
Infection control guidelines for long term care facilities	J/F92
Outbreak summary 1991	J/S92
Platelet transfusion	
associated sepsis	M/A92
Postsurgical infections associated with implantable devices	M/J92

OCCUPATIONAL

Asbestos exposure in custodians	O/D92
Bureau of Environmental Epidemiology	
1992 report	J/S92
Missouri fatal accident circumstances and epidemiology (MOFACE)	M/A92,O/D92

New STD Program Managers in Kansas City and St. Louis

Nyla DeArmitt reported to the Kansas City Health Department as Program Manager of the Sexually Transmitted Disease (STD) program on October 4, 1992. Ms. DeArmitt is a public health advisor with the Centers for Disease Control and Prevention (CDC).

She started her career as a public health advisor in the St. Louis City STD program and then worked in the North Carolina STD program as a supervisor in Charlotte.

Joseph Betros, a public health advisor with the CDC, has worked extensively with STD programs in Chicago, Cleveland and Miami before his assignment as the STD program manager in the St. Louis City Department of Health and Hospitals on December 14, 1992.

These two public health advisors bring a wealth of valuable experience which will help each city meet the challenge of increasing STD morbidity.

Occupational fatality prevention program	M/A92,O/D92
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OFFICE OF EPIDEMIOLOGY

Physician epidemiologist joins staff	O/D92
--------------------------------------	-------

RABIES

Annual summary 1991	J/S92
---------------------	-------

SEAFOOD

Ciguatera poisoning linked to Florida Amberjack	J/F92
Scombroid fish poisoning in Atlanta	O/D92

SEXUALLY TRANSMITTED DISEASES

Bureau chief retires	M/A92
<i>Chlamydia trachomatis</i> annual summary 1991	J/S92
implementation of Gen-Probe	M/A92
Gonorrhea	
annual summary 1991	J/S92
implementation of Gen-Probe	M/A92
HIV/AIDS	
annual summary 1991	J/S92
case definition expanded	O/D92

confidentiality of records	O/D92
consultation rules	O/D92
health care workers	O/D92
hotlines	J/S92
surveillance in Missouri	M/J92
Nongonococcal urethritis	J/S92
Syphilis	
annual summary 1991	J/S92
congenital surveillance	
case definition	J/S92
increase in Missouri	M/A92
outbreak emergency	
declared in Missouri	O/D92
outbreak in St. Louis City	M/A92

STATE PUBLIC HEALTH LABORATORY

Annual report 1991	J/S92
Courier service	O/D92
Laboratory services manual	M/A92
Newborn screening	M/J92

KEY

J/S92	= July/September 1992
J/F92	= January/February 1992
M/A92	= March/April 1992
M/J92	= May/June 1992
O/D92	= October/December 1992

Community-wide Hepatitis A Epidemic in St. Louis

Carol Friedman, D.O.
Office of Epidemiology

Hepatitis A spread in epidemic proportions in the metropolitan St. Louis area during 1992. The total cases reported for 1992 exceeded 1,000. The largest number of cases was in the City of St. Louis with 647 cases reported for a case rate of 163 per 100,000 population. St. Louis County had 287 cases reported for 1992 for a case rate of 29 per 100,000 population. Franklin, Jefferson, and St. Charles counties reported 6, 59, and 20 cases, respectively.

The hepatitis A epidemic is showing no evidence of slowing down. As of Feb. 12, 1993, the City of St. Louis reported 157 cases and St. Louis County had 86 cases of hepatitis A. See Figure 1.

The average number of cases reported for each of the previous three years, 1989–91, for the Eastern District was 141, for a rate of 7.6 per 100,000. See Figure 2.

The highest attack rate was in the 15–29-year-old age group. In the City of St. Louis 80 percent of the cases were African-American, while in St. Louis County 60 percent of the cases were African-American. Females accounted for 40 percent of the cases in St. Louis County, and 48 percent in the City of St. Louis.

The major risk factor for transmission of hepatitis A has been contact with a confirmed or suspected hepatitis A case. Restaurant use and day-care attendance were not found to be major risk factors.

A major problem in attempting to control the spread of hepatitis A is the large proportion of mild and inapparent cases who either do not seek medical attention or whose diagnosis is missed by their physicians. These subclinical cases are therefore never identified or reported and serve to continue to spread hepatitis A through the community. Consequently, physicians in the St. Louis metropolitan area are urged to maintain a high level of suspicion for hepatitis A in

any patient who presents with nausea, abdominal pain, fatigue, anorexia, fever or jaundice. Physicians should order IgM anti-HAV testing to make the diagnosis of acute hepatitis A. Other laboratory tests include a CBC, UA, liver enzymes, and prothrombin time.

In addition, physicians need to instruct their patients about careful handwashing, especially after using the toilet and before preparing food.

Prompt reporting of suspected or confirmed cases of hepatitis A to local health departments is essential to ensure that passive immunization with immune

globulin (IG) is provided to contacts in a timely manner. Immune globulin is most effective if administered within two weeks after exposure. To report a confirmed or suspected case of hepatitis A contact the St. Louis Health Division at (314) 658-1128 or the St. Louis County Health Department at (314) 854-6630.

By maintaining a high level of suspicion for cases of hepatitis A among their patients, prompt reporting of suspected and confirmed cases to local health departments and discussing proper handwashing with their patients, physicians can help control the spread of this epidemic.

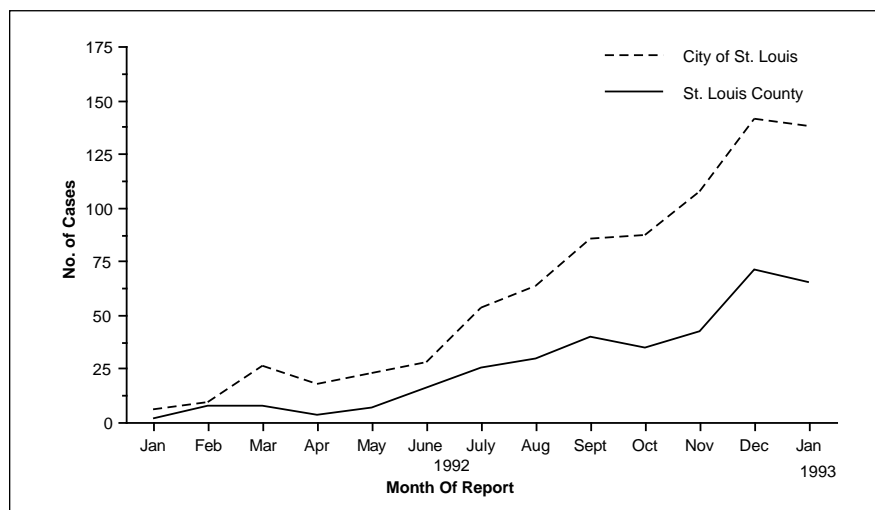


Figure 1. Hepatitis A cases by month of report, St. Louis City and County, Missouri, 1992 and 1993

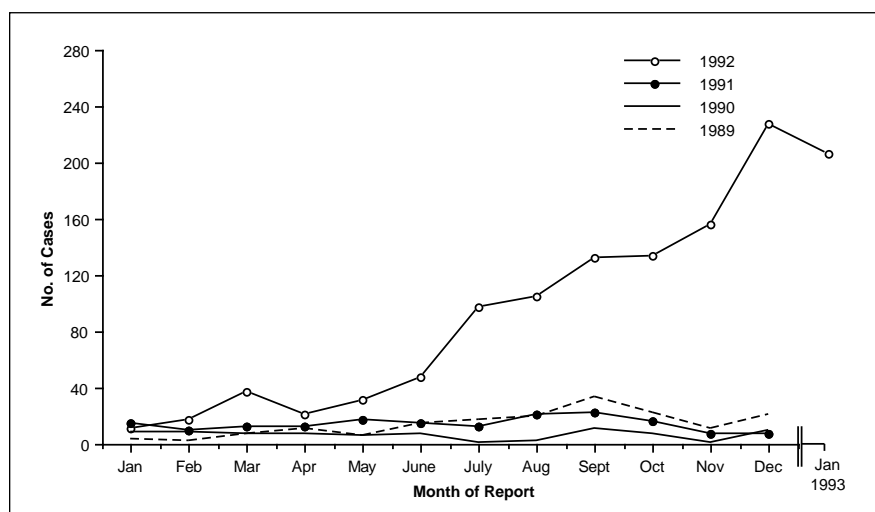


Figure 2. Hepatitis A cases by month of report, Eastern District, Missouri, 1989–93

Anti-tuberculosis Medication Program Change

This is written to notify physicians and other health-care providers of a program change regarding the provision of anti-tuberculosis medications by the state's contract pharmacy. The policy of providing only a one-month supply of medication(s) per patient each month began in August 1991. This approach was tried in order to reduce wastage that occurred when a three-month supply of medication(s) was sent to the local health department for a given patient and the patient moved, died or the diagnosis was changed. Although a reduction in wastage may have been realized, the cost of filling each monthly prescription as well as the increasing costs of medications are quickly eroding the Bureau of Tuberculosis Control budget. Therefore, the following program change was made effective September 1, 1992:

A three-month supply of anti-tuberculosis medications will be sent by the state's contract pharmacy to the local health departments for distribution rather than the current practice of sending a one-month supply per patient each month.

As outlined in the Tuberculosis Control Manual, the bureau requires that only a one-month supply of medication be given to the patient at a time. Appropriate clinical monitoring for side effects should be performed on a monthly basis. Re-orders should be sent to the pharmacy when the third month's supply is administered to the patient.

The bureau apologizes for any inconveniences that may occur as a result of this program change.

If you have any questions concerning this information, please contact the Bureau of Tuberculosis Control at (314) 751-6122.

Hepatitis A Incidence, 1992

Mahree Skala, M.A.

Bureau of Communicable Disease Control

Reported incidence of hepatitis A rose 129 percent, from 653 cases in 1991 to a provisional total of 1,498 cases in 1992, the highest number ever reported in the state. Most of the increase occurred in the Eastern and Southwestern districts, as shown in Figure 1 (see related article on page 13).

The ten counties with the highest rates are shown in Table 1. Of the top ten, only Butler County and Kansas City decreased in comparison with 1991; all others showed significant increases.

Statewide, the average person with hepatitis A was 23 years old. Persons 20-24 years old had the highest incidence rate (66/100,000 population), followed by those 15-19 years old (53/100,000). Children 5-14 years old had a rate of 45/100,000. More males than females were affected (52% vs. 47%). The incidence rate for African-Americans was 129/100,000 population compared with 16/100,000 among whites, for a rate ratio of 8:1.

Of the 242 cases in the Southwestern District, 221 (91%) occurred in the Joplin/Jasper County/Newton County
(continued on page 15)

Table 1: Missouri Counties with Highest Hepatitis A Incidence Rates, 1992

County	1991 Cases	1992 Cases	1992 Rate/100,000
Jasper	4	172	190
St. Louis City	85	647	163
Camden	1	33	120
Pike	1	18	113
Newton	0	49	110
Butler	77	21	54
Jefferson	2	59	34
Dunklin	5	10	30
St. Louis County	71	287	29
Kansas City	164	67	15

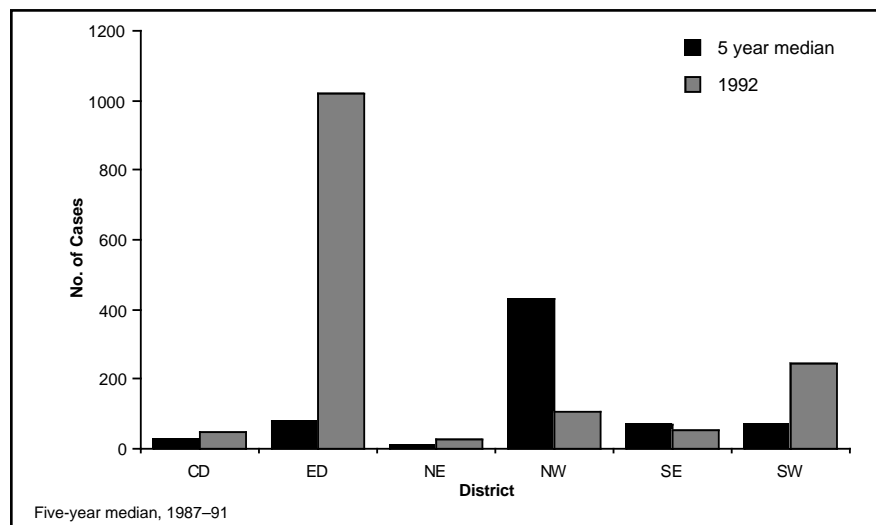


Figure 1. Reported hepatitis A cases by district, Missouri, 1992 and five-year median

Influenza Isolates 1992/93 Season Predominantly type B

A total of 248 laboratory-confirmed cases of influenza had been reported as of February 18, 1993. Of these, 240 (97%) are type B with 54 subtyped as B/Panama-like; eight (3%) are type A with two subtyped as A/Taiwan-like (H1N1). See Table 1.

This season's reported level of influenza-like illness had closely paralleled the previous six-year average until a sharp increase during weeks four through six. Pneumonia and influenza deaths have fluctuated around the previous nine-year average. Figure 1 illustrates flu-like illnesses and Figure 2 shows pneumonia and influenza deaths.

Most of the laboratory-confirmed cases (63%) have been in children under 10 years of age. Twenty-eight percent (28%) were under one year of age, 22 percent were age 1–4, and 13 percent were age 5–9. Schools were reported to be closed due to influenza-like illness in 18 school districts throughout the state between December 14, 1992 and February 5, 1993.

Missouri's level of influenza activity as reported to the Centers for Disease Control and Prevention has been classified as "widespread" since January 29, 1993.

Table 1. Reported laboratory confirmed cases of influenza, Missouri, as of February 18, 1993

District	Type A (not subtyped)	Type A Taiwan (H1N1)	Type B (not subtyped)	Type B Panama	Total
Central	3	0	5	28	36
Eastern	2	2	171	3	178
Northeastern	0	0	0	4	4
Northwestern	1	0	0	2	3
Southeastern	0	0	8	8	16
Southwestern	0	0	2	9	11
Total	6	2	186	54	248

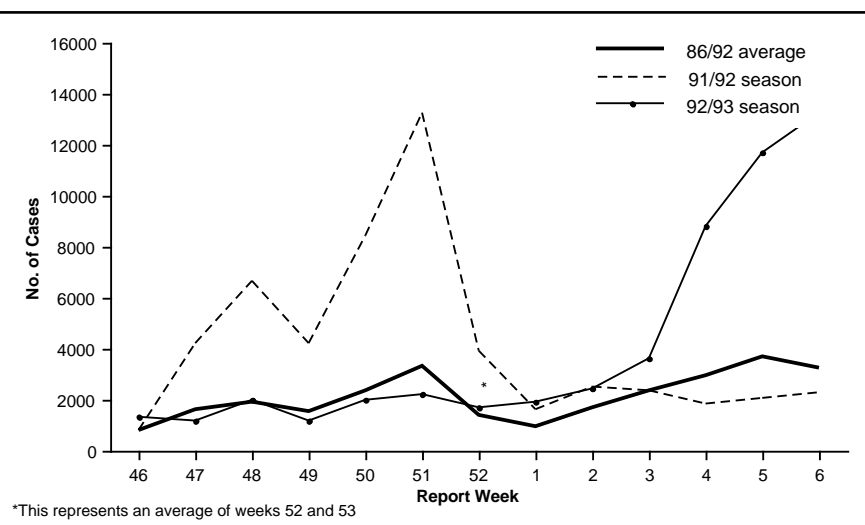


Figure 1. Influenza-like illness by week of report, Missouri, 86/92 average, 91/92 season and 92/93 season

Hepatitis A in Missouri

(continued from page 14)

area. This outbreak began in December 1991 and peaked in May 1992. The average case there was somewhat younger than the state average, at 21 years, and more cases were female (52%). Only 1.4 percent of those affected were African-American.

During the first six weeks of 1993, a total of 285 cases of hepatitis A has been reported. Most (250 or 88%) are from the Eastern District. Although there were 28 cases in the Joplin area in December 1992, only seven have been reported during the first six weeks of 1993.

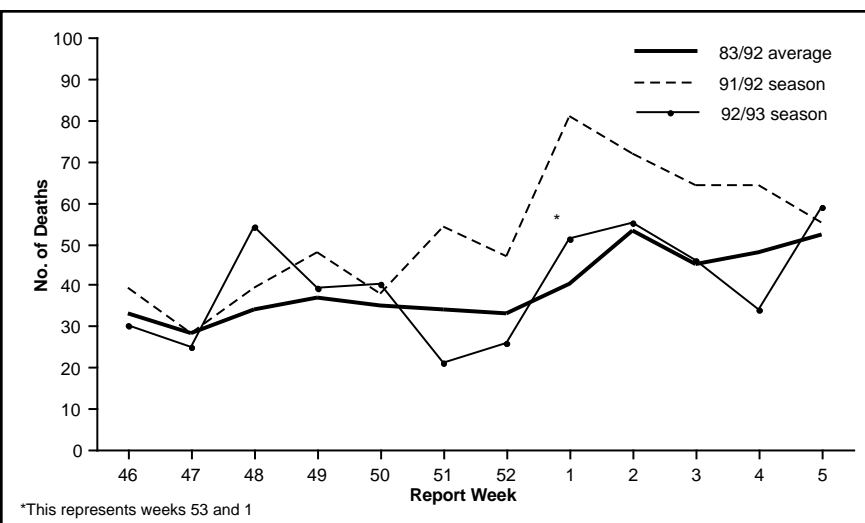


Figure 2. Pneumonia and influenza deaths by week of report, Missouri, 83/92 average, 91/92 season and 92/93 season



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TB Awareness Fortnight - March 14-27, 1993

The seventh annual Tuberculosis Awareness Fortnight for Missouri is scheduled March 14-27, 1993. During this period of time, special activities will be held to raise levels of awareness concerning tuberculosis. Some of the activities will include seminars on tuberculosis, grand rounds presentations in medical schools and hospitals, articles on tuberculosis in newspapers and newsletters, and ceremonies for the issuance of proclamations which underscore these educational efforts.

In the St. Louis area, the focal point of this year's awareness activities will be the Second Annual American Lung Association Comprehensive Conference to be held March 22 & 23, 1993. This year's featured speakers include Dr. Lee Reichman, president of the American Lung Association; Dr. Jeff Starke, assistant professor of pediatrics, Texas

Children's Hospital and Ms. Mary Hutton, epidemiologist/nurse consultant, Division of Tuberculosis Elimination, Centers for Disease Control and Prevention. Dr. Reichman will discuss the resurgence and management of tuberculosis and treatment of tuberculosis. Dr. Starke will discuss prevention of tuberculosis and childhood tuberculosis. Ms. Hutton will discuss nosocomial tuberculosis. In addition, Dr. Reichman will discuss tuberculosis risk to health-care workers at a special evening dinner which is separate from the conference.

For additional information on St. Louis activities, please contact Ruby Jones, American Lung Association of Eastern Missouri at (314) 645-5505.

The awareness activities in Kansas City will include grand rounds on March 19 at the University of Missouri School of

Medicine-Kansas City. The presenter will be Dr. Philip C. Hopewell, professor of medicine, University of California, San Francisco and chief, division of pulmonary critical care medicine, San Francisco General Hospital. Dr. Hopewell will also conduct clinical rounds at St. Luke's Hospital of Kansas City.

A nursing workshop on skin testing for nursing home personnel and school personnel will be held in Kansas City. A fee of \$25 is being charged for the workshop. Contact hours will be awarded. For additional information on Kansas City activities, please contact Irene Minor, American Lung Association of Western Missouri at (816) 842-5242.

Information may also be obtained from the Bureau of Tuberculosis Control at (314) 751-6122.



EPIDEMIOLOGIST

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Working in the Highest Risk Industry: AGRICULTURE

Thomas D. Ray
Bureau of Environmental Epidemiology

Most rural and farm family members are aware of potential hazards associated with farms. Farming is hard, rewarding work, but it can also be very dangerous. Agriculture continues to be the leading industry for occupational fatalities and injuries in Missouri. Agriculture is an inherently dangerous occupation. Many farm workers are not aware of all the life threatening hazards they face daily. Safety and health programs that help farmers to recognize and avoid these hazards can assist in lowering the number of agricultural work-related incidents in the state.

Missouri has 5.1 percent and 3.1 percent of the nation's farms and farmland, respectively. There are approximately 107,000 farms in Missouri, averaging 284 acres each and totaling 30.4 million acres statewide. Agriculture employs approximately 130,000 persons statewide, of whom approximately 22,000 are hired workers.¹

In Missouri, agricultural work incidents are the most frequent cause of work-related deaths. During the period 1986-92, there were 265 agricultural work-related deaths. Agricultural machinery was blamed for about 80 percent of all farm fatalities during this period, with tractor incidents responsible for the majority of these fatalities. Table 1 is a list of fatal injuries in agriculture from 1986-92.

The agricultural community is also greatly affected by injuries. According

to the 1989 Missouri-National Institute for Occupational Safety and Health and the National Safety Council (NIOSH/NSC) Farm Work Injury Mail Survey, there were 15.6 incidents per 100 farms in Missouri. Machinery and livestock accounted for over one-half of these injury incidents. The survey results indicated that the hand was the most frequent body part injured, followed by the arm/shoulder and back. The most frequent types of injury were cuts, sprains, strains and bruises.

The Occupational Safety and Health Administration (OSHA) was established to assure workers a safe and healthy workplace. However, Missouri farms are mostly individual or family enterprises and are exempt from OSHA enforcement. Today there are very few programs that deal exclusively with farm safety and health, but one program is the University of Missouri Extension Service. Since 1975, the program's primary objective has been to help agricultural operations develop and implement work practices that will result in a safe and healthy work environment with fewer accidents, injuries, fatalities and health-related disabilities. This program has also entered into a cooperative agreement with NIOSH to fund an Agricultural Health Promotion System. This program will enable the University of Missouri to expand its program and technical assistance efforts, addressing specific agricultural safety issues in the development of a comprehensive, statewide agricultural health program. One objective of the program is to increase the farm family's awareness of occupa-

tional safety and health and develop model programs for their farms. The target audience is farm women since they are becoming a more active partner in farm operation and have tremendous influence with the youth and male populations. This program is currently conducting Farm Women's Safety Workshops that include hands-on experience in which participants actually use farm equipment to learn safety precautions and procedures.

The Department of Health has several programs dealing with occupational safety and health, of which farm safety is a major concern:

1. The Office of Injury Control established with a grant from the Centers for Disease Control and Prevention (CDC) to develop a state and community-based injury control program for Missouri. A
(continued on page 2)

Inside this Issue...

Page	
4	Missouri's Charcoal Kilns
6	Childhood Lead Poisoning
8	Lyme Disease in Missouri?
10	HIV/AIDS in Rural Missouri
18	Campylobacter Infection in Poultry Processing Workers
20	Multidrug-Resistant Tuberculosis
23	Missouri Office of Rural Health
24	Standards for Pediatric Immunization Practices

Table 1. Agricultural, Unintentional Injury Deaths by Agent of Accident, Missouri, 1986-91

Agent	1986	1987	1988	1989	1990	1991	1992	Total	Percent
Machinery	36	33	32	25	28	30	27	211	79.6
Tractor	24	28	28	19	26	25	21	171	
(Overturns)	(15)	(14)	(16)	(12)	(12)	(15)	(11)	(95)	
Auger	3	0	0	1	0	0	0	4	
Truck	1	2	1	2	0	1	3	10	
Mower	2	1	2	2	0	0	1	8	
Misc.	6	2	1	1	2	4	2	18	
Animal	1	0	1	1	0	2	2	7	2.6
Tree Cutting	0	4	5	0	1	3	1	14	5.3
Grain Bins	0	2	1	0	0	0	1	4	1.5
Electrocution	0	2	1	2	2	0	2	9	3.4
Drowning	0	1	0	1	0	0	0	2	0.8
Fire	0	0	2	1	0	1	0	4	1.5
Unspecified	6	2	0	2	1	1	2	14	5.3
Total	43	44	42	32	32	37	35	265	100.0

(continued from page 1)

Work/Agricultural Safety and Health Study Group has been established and has drafted a Missouri Plan for Work/Agricultural Safety and Health. This plan outlines the goals for Missouri with regard to industrial safety and the recommendations and strategies to achieve these goals.

2. The Census of Fatal Occupational Injuries (CFOI) Project is funded by the National Bureau of Labor Statistics. The purpose of this program is to identify accurately every occupational fatality in the state. The information will be used to understand better the hazards workers face and to develop accident-prevention programs.

3. The Missouri Fatality Assessment and Control Evaluation (MO FACE) program is a traumatic occupational fatality surveillance and intervention activity. The objective of this surveillance, research and intervention program is to prevent future fatal work injuries by studying past occurrences. The program currently has detailed epidemiological investigation protocols for falls, electrocutions and asphyxiation deaths caused by entry into confined spaces. In addition, the MO FACE program is participating in a pilot study on agricultural fatalities.

Through these safety programs, efforts are being made in response to the needs of the agricultural community. The reduction and prevention of injuries and fatalities is the overall goal of all safety and health programs.

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State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Nov 92	Dec 92	Total YTD
Specimens Tested	8,560	10,094	116,483
Initial (percent)	69.3%	68.6%	79,827
Repeat (percent)	30.7%	31.4%	36,656
Specimens: Unsatisfactory	101	142	1,398
HT Borderline	461	509	5,869
HT Presumptive	15	26	218
PKU Borderline	11	11	215
PKU Presumptive Positive	2	0	9
GAL Borderline	28	22	477
GAL Presumptive Positive	0	1	25
FAS (Sickle cell trait)	75	93	1,151
FAC (Hb C trait)	16	33	309
FAX (Hb variant)	18	14	205
FS (Sickle cell disease)	0	3	33
FSC (Sickle C disease)	1	1	17
FC (Hb C disease)	1	0	8

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Lead in School Drinking Water

Richard H. Gnaedinger, Ph.D.
Bureau of Environmental Epidemiology

Under the Lead Contamination Control Act of 1988 (LCCA), states were required to develop programs designed to assist schools and day care centers in identifying potential lead contamination problems in their buildings and to suggest remedies for such identified problems. In Missouri, the program was designed to study the prevalence of lead in drinking water fountains and other outlets used for drinking and cooking. Under the LCCA, a drinking water outlet was considered a potential problem when the water coming from it contained more than 20 parts per billion (ppb) of lead. The results of this study were published in the January/February 1992 issue of the *Missouri Epidemiologist*, and is also scheduled for publication in the April issue of the *Journal of Environmental Health*.

Shortly after the passage of the LCCA, the Environmental Protection Agency (EPA) promulgated on June 7, 1991, an action level of 15 ppb for lead in drinking water under the Lead and Copper Rule (LCR). This rule, which amended the Safe Drinking Water Act of 1974, became effective on November 7, 1991. Missouri compliance testing under the rule started on January 1, 1992. The LCCA and the LCR both require testing of water for lead at the point of use (POU) instead of at the point of entry as required under the Safe Drinking Water Act.

In view of this new standard for drinking water, the data received from the schools and day care centers under the LCCA study were reanalyzed using 15 ppb as the action level. The latter results are presented in Table 1. For this analysis, as in the previous study, an attempt was made to distinguish the drinking water coolers from the non-cooled fountains, sometimes referred to as bubblers. From the descriptions given by the schools and day care centers on the preprinted survey forms, this distinction was not

always clear. The same was true for the various types of sinks. However, a sufficient number of outlets were accurately described to show a valid trend.

As expected, the number of outlets exceeding the 15 ppb action level under the LCR was slightly higher than the number exceeding 20 ppb under the LCCA. For example, 5.8 percent of the drinking water coolers in the public schools exceeded 15 ppb; whereas only 3.7 percent exceeded the 20 ppb level. In the day care centers, the values were 8.0 versus 4.7 percent, and in the private and parochial schools, the values were 4.4 and 3.0 percent. This same trend was seen in both the non-cooled drinking water fountains and the sinks. When all the outlets were considered collectively, the percentages were 8.6 versus 5.6 for public schools, 5.5 versus 2.4 for day care centers, and 4.7 versus 3.5 for private and parochial schools.

The results of this study could serve as a useful guide to both water plant operators and to those responsible for imple-

menting the LCR. Under the rule, a public water system is required to test a certain number of the outlets that it serves, based on size. For example, if all the samples were taken randomly from drinking water coolers in public schools, 5.8 percent of those are expected to test above the action level, and if all the samples were taken from kitchen sinks in day care centers, 3.3 percent would test above 15 ppm.

Administrators of those schools and day care centers who have not yet tested their drinking water may find these results of interest in estimating what percentage of the outlets in their institutions are expected to pose a certain degree of risk to the students using them. Since many of the schools and day care centers reported having one or more at-risk outlets, it is expected that many others would also have some potential lead contamination problems related to the drinking water in their buildings. In view of this, we continue to recommend that testing of all drinking water outlets be done as soon as time and resources permit.

Table 1. Summary of Test Results by Type of Outlet – Percent Exceeding 15 ppb of Lead, Missouri, 1990

Type of Outlet	Public Schools	Day Care Centers	Other*
Drinking Water Coolers	3054	100	205
>15 ppb	5.8%	8.0%	4.4%
Fountains (non-cooled)	736	66	61
>15 ppb	9.9%	4.5%	4.9%
Sinks (kitchen/cafeteria)	739	99	56
>15 ppb	10.7%	3.3%	3.6%
Sinks (classroom)	623	33	00
>15 ppb	13.5%	15.2%	0.0%
Sinks (other**)	688	120	36
>15 ppb	13.1%	3.3%	5.6%
Icemakers	49	3	7
>15 ppb	12.2%	0.0%	16.7%
All Outlets	5889	421	365
>15ppb	8.6%	5.5%	4.7%

* Private and parochial schools

** Lounge, lunchroom, office, workroom, dishwasher, steam cooker/boiler, sprayer, disposal, lavatory, bathroom, outside faucet, etc.

Missouri's Charcoal Kilns

Randall Maley
Bureau of Environmental Epidemiology

One of the major debates of recent years is how much environmental protection can we, as a society, afford. The debate has centered less on the direct cost of the regulations, enforcement and cleanup than on the indirect cost to business and society. Conservatives and industrial officials argue that there is a trade-off between the economy and the environment; that stringent environmental regulations cost jobs. Most environmentalists argue that environmental regulations do not have an adverse effect on the economy, but merely shift jobs to different sectors of the economy, i.e., fewer jobs in some industries, but new jobs in pollution-control technology. Some hard-line environmentalists say it does not matter if pollution control does cost some jobs. They assert that "if you can't afford to do it right, you shouldn't be allowed to do it at all." Their belief is that the planet is too fragile to allow continued environmental degradation, and point to acid rain, global warming and the hole in the ozone layer as evidence that we must pursue more aggressive environmental regulations.

Nowhere has this issue been more hotly debated than in the Missouri Ozarks. One of the major industries in this economically depressed area is charcoal production. Missouri is the only state in the country that still allows the production of charcoal from kilns without emission controls. Missouri-type kilns are basically long, concrete bunkers with vent pipes at various locations and large doors at one end. The bunker is filled with wood that is burned in a low-oxygen environment.

The Department of Health (DOH) receives complaints annually from residents living near the kilns. At a distance, the odor from the kilns is usually a mild, somewhat pleasant, wood-smoke odor. Up close, however, the kilns sometimes produce thick, acrid smoke that can cause nausea, headache and respiratory irrita-

tion. Residents are generally concerned that the smoke from the kilns may cause health problems such as cancer, emphysema, asthma and allergies. Occasionally, complaints are received that the smoke is so thick that people can't see to drive down the road. Complaints are usually made by private individuals, but have also been received from public officials.

Some Department of Natural Resources (DNR) officials believe the charcoal kilns are a major cause of air pollution in the region. They are unable to regulate adequately the kiln operations because state law allows preferential treatment: charcoal kilns are specifically exempted from state regulations governing the amount of particulates and the thickness of the smoke a facility can release. The regulations also contain a loophole that allows a kiln operator to repair or rebuild 50 percent of a kiln each year, so that a completely new kiln can be in place in only two years. With this loophole in

place, all kiln operations that were "grandfathered in" in 1979 will be able to continue indefinitely without emission controls.

Kiln operators argue that they cannot afford to install emission-reduction equipment. They argue that charcoal production is only marginally profitable and the additional financial burden caused by emission control would force them out of business. While other states regulate kiln emissions, Missouri's kiln operators assert that they cannot pass the cost of emission control on to consumers because of alternatives to charcoal. They argue that if the cost of charcoal increased, more people would switch to gas barbecue grilles. In addition, some operations are now making briquets out of charcoal mixed with lignite coal. An increase in the cost of charcoal might lead other briquet producers to utilize this alternative. Finally, they argue that the kilns utilize "slash lumber," the wood

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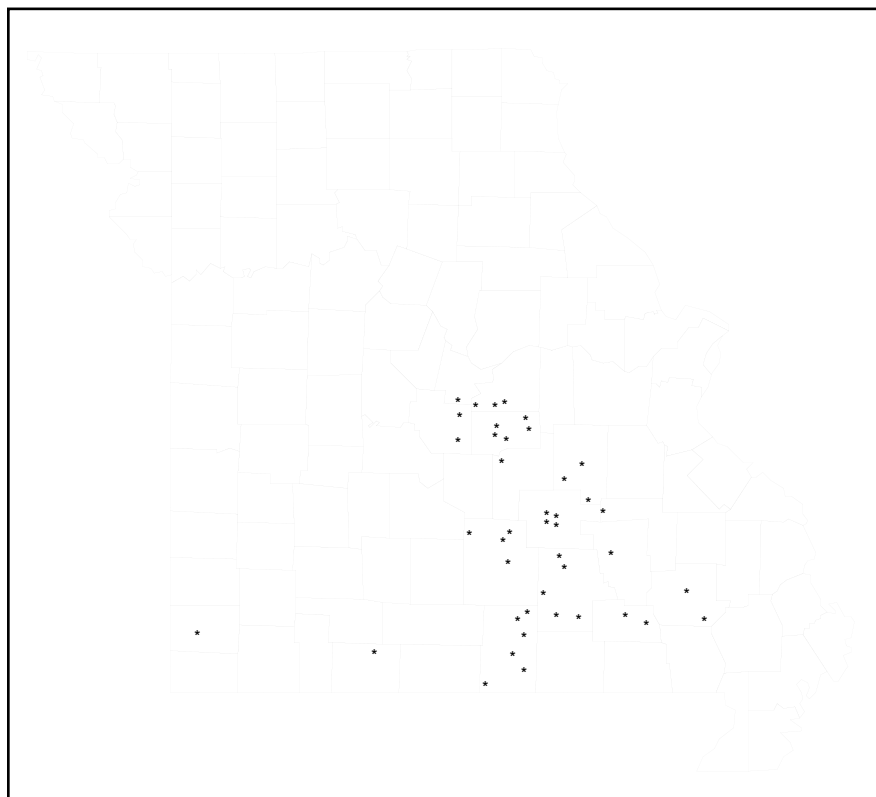


Figure 1. Location of charcoal kiln operations in Missouri, 1993

Radon, Diet and Lung Cancer Risk in Missouri Women

Ross C. Brownson, Ph.D.
Division of Chronic Disease Prevention
and Health Promotion

Michael C.R. Alavanja, Dr.P.H.
National Cancer Institute

The Missouri Department of Health, in collaboration with the National Cancer Institute, has begun the second phase of a large study of lung cancer among Missouri women. While the first phase of the study focused on nonsmoking women, this new phase involves a case-control study of both smokers and nonsmokers. The goal of the new study is to evaluate the risk of lung cancer in relation to several factors including residential radon exposure and dietary habits.

In the earlier Missouri study conducted between 1987 and 1992, researchers identified several important risk factors for lung cancer in nonsmoking women. These included a history of nonmalignant lung disease (*e.g.*, pneumonia, emphysema)¹, exposure to environmental tobacco smoke², and certain dietary factors.³ Data are currently being analyzed

to evaluate the risk of nonsmoking lung cancer in relation to residential radon exposure. This earlier study is noteworthy because it is one of the largest studies of nonsmoking lung cancer ever conducted.

The new study will build on the experience from the earlier investigation. Although the Environmental Protection Agency has set four picocuries per liter as the action level for radon, this level is based largely on occupational studies of uranium and iron ore miners rather than on studies of residential radon exposure. By studying both smokers and nonsmokers who develop lung cancer, we will be able to evaluate the possible synergistic effects of cigarette smoking and radon exposure.

An additional aspect of the new lung cancer study will examine the effects of certain dietary factors. Various studies have reported that low intake of beta-carotene and high intake of dietary fat may increase risk of lung cancer. In addition, cooked foods, especially

cooked meats, may contain higher levels of certain mutagens, which may in turn increase the risk of certain cancers (including lung cancer). The new study will examine these hypotheses in detail.

As in the earlier phase, the new study will utilize case-control methods. Cases for the study will be identified through the Missouri Cancer registry, which is maintained by the Missouri Department of Health. Since 1984, Missouri hospitals have been mandated by state law to report all cancer cases to the registry. Approximately 1,000 cases of female lung cancer per year are reported to the registry. The new study will involve interviews with approximately 700 Missouri women with lung cancer.

Controls for the study will include healthy Missouri women who are matched for age and smoking status. Younger controls (aged 30–64 years) will be identified through a random sample of Missouri drivers license files. Elderly controls (aged 65 years and older) will be identified through the federal Medicare system.

Interviews for the new study began in March 1993. The study is expected to be completed by late 1994 or early 1995. More information about the lung cancer study can be obtained by calling Dr. Brownson at (314) 876-3200.

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Charcoal Kilns

(continued from page 4)

left by logging and sawmill operations that, if not used by the kilns, would be piled up and burned or left to rot. An independent study based on objective financial data has never been performed. Until such a study is undertaken, it is impossible to state with any certainty whether emission control would have a significant economic impact.

DOH is unsure of the health impact of kilns on area residents. The kilns certainly can be a nuisance to nearby residents and could potentially exacerbate pre-existing respiratory conditions and/or allergies. Whether or not the kilns represent a more serious health risk is unknown. Uncontrolled kilns like those used in Missouri have been outlawed everywhere but Arkansas for so long that little research on emissions or adverse health effects has been conducted.

Other states shut down or required modification of these kilns before modern scientific equipment was available to detect concentrations of contaminants in the part per billion range. It is known that kilns produce large quantities of particulates, carbon monoxide and carbon dioxide, as well as volatile organics and sulfur dioxide. DOH suspects that kilns also produce significant levels of polynuclear aromatic hydrocarbons (PAHs), some of which, such as benzo(a)pyrene, are potent carcinogens. DNR is currently completing a study to determine the level of particulates in a populated area downwind of a charcoal operation. Once this study is complete, the DOH plans to perform air sampling to determine the level of contaminants in homes potentially affected by the kiln emissions. These studies will not end the controversy surrounding this volatile issue, but at least there will be a basis in fact on which to debate.

Childhood Lead Poisoning

Michael Carter, B.A.
Division of Environmental Health and Epidemiology

Childhood lead poisoning is the most common environmental, preventable, pediatric health problem today. Ingestion of household dust containing lead from deteriorating or abraded lead-based paint is the most common cause of lead poisoning in children. Other sources and pathways for lead include food, water, air and soil. Throughout human history lead has been used in paints, glazes, eating utensils, plumbing, drugs, manufacturing, and in recent history, gasoline.¹ In addition to usual exposures, Missouri citizens have been exposed to lead via mining, milling and smelting operations, as Missouri ranks as the number one lead-producing state in the nation.²

At low levels, lead poisoning in children may cause intelligence quotient deficiencies, reading and learning disabilities, impaired hearing, reduced attention span, hyperactivity, and behavior problems.³ Lead is ubiquitous in the environment and it readily crosses the placenta during pregnancy. Young children are more vulnerable to the effects of lead because they absorb a larger amount per unit of body weight than adults. Young children ingest more lead through hand-to-mouth activity (pica), and retain a larger fraction of the ab-

sorbed lead than adults.⁴ The nutritional status and well-being of children at the time of their exposure to lead can play a role in the toxicity of lead.¹ The Centers for Disease Control and Prevention (CDC) recommends that children between the ages of six months and six years of age be screened for blood lead levels; this is the age when children are most vulnerable to the developmental, neurotoxic effects of lead. The CDC states that children with blood lead levels 10 µg/dL (micrograms per deciliter) or greater begin to suffer the harmful effects of lead, and those with blood lead levels above 19 µg/dL should be evaluated medically.⁵ See Table 1.

The U.S. Department of Housing and Urban Development (HUD) estimates approximately 74 percent of privately owned housing units built before 1980 contain lead-based paint, and greater than 90 percent of such units in St. Louis City are estimated to contain lead-based paint. The age of the housing stock in a given area may indicate the general levels of exposure from lead paint. For example, the oldest housing has the highest lead concentrations in its paint and the highest frequency of lead poisoning per age category.¹ The two largest cities in the state, St. Louis City and Kansas City, rank among the top 30 cities in the nation for the number of children between six months and five years of age living in pre-1950 housing.¹

A recent survey by the Department of Health indicates that Missouri may have a significant problem of lead-poisoning exposure in the outlying areas of the state.² The survey found that 12 percent of the children screened in rural areas had blood lead levels of 10 µg/dL or greater on the initial fingerstick screen, with two percent above 20 µg/dL. In the Kansas City metropolitan area, 14.2 percent of the children had blood levels at or above 10 µg/dL. In rural Missouri, one child in ten was found to have blood lead levels above 10 µg/dL using fingerstick samples.

Data collected in 1992 by the St. Louis City Health Department showed that nearly 50 percent of children screened had blood lead levels above 10 µg/dL threshold level and nine percent were elevated above 20 µg/dL, requiring medical intervention and environmental action.

These surveys indicate the need to initiate a statewide effort aimed at eliminating childhood blood lead poisoning and preventing childhood lead exposure.² To address the problem of childhood lead poisoning, the Department of Health has designated a project specialist to coordinate the various childhood lead-poisoning efforts in the state, to act as liaison with the legislature to effect lead-poisoning prevention laws, to be
(continued on page 21)

Table 1. Interpretation of blood lead test results and follow up activities: class of child based on blood lead concentration		
<u>Class</u>	<u>Blood Concentration (µg/dL)</u>	<u>Comments</u>
I	≤ 9	A child in Class I is not considered to be lead-poisoned.
IIA	10-14	Many children (or a large proportion of children) with blood lead levels in this range should trigger community-wide childhood lead poisoning prevention activities. Children in this range may need to be rescreened more frequently.
IIB	15-19	A child in Class IIB should receive nutritional and educational interventions and more frequent screening. If the blood lead level persists in this range, environmental investigation and intervention should be done.
III	20-44	A child in Class III should receive environmental evaluation and remediation and a medical evaluation. Such a child may need pharmacologic treatment of lead poisoning.
IV	45-69	A child in Class IV will need both medical and environmental interventions, including chelation therapy.
V	≥ 70	A child with Class V lead poisoning is a medical emergency. Medical and environmental management must begin immediately.

Why We Should Support Legislation for On-Site Sewage Systems

Nix Anderson

Bureau of Community Environmental Health

There are approximately 430,000 homes using on-site systems in Missouri. Surveys conducted throughout the state have shown that approximately 64 percent (274,285) of these systems are failing. Each home produces an average of 200 gallons of sewage per day. This would assume that approximately **55 million gallons** of sewage are being put into our lakes, rivers and streams **per day**. Although this figure really jumps out and scares us, we must remember this is only the sewage that we see on the surface of the ground. These surveys do not take into consideration the amount of sewage that is going into the groundwater because of improperly designed and poorly located systems.

Statistics from the State Public Health Laboratory show that from 30–43 percent of private water samples submitted during the past five years did not meet drinking water quality standards. Surveys conducted and supervised by sanitarians have supported these statistics, and in some cases, have shown even higher levels of contamination.

Sewage has been associated with many human diseases—salmonellosis, giardiasis, hepatitis A, Norwalk and other viral gastroenteritis and shigellosis are just a few of these diseases.

At the present time, Missouri has no control over the installation of on-site sewage systems. Many systems are being put into incompatible soils which won't support that particular system. If the present course of events continues, all of our groundwater, lakes, rivers and streams will eventually become polluted.

The Department of Health is supporting legislation toward better control of on-site sewage systems. This legislation would enable the department to:

- adopt minimum construction standards;

- require issuance of permits and final inspections of all on-site installations;
- require registration and education of all on-site system installers;
- require repairs to existing, failing systems when there is a complaint;
- provide for penalties to those who do not conform to the standards.

Legislation such as this will impact many of the building trades, such as subdividers, installers, plumbers and carpenters. Bankers, realtors and home buyers will also be affected.

It is readily seen from the preceding statistics that a negative public health impact is a real possibility in Missouri. Unfortunately, preventive measures in public health are very hard to sell. Most of us want to know what the economic impact will be on our pocketbooks and how it will affect us.

Let's first talk about the building trades industry. Subdividers spend a lot of "up front" money to enhance the desirability of contractors to build and potential homebuyers to buy. These amenities often include lakes, rivers, streams and other environmental attractions. Often soil conditions are not considered and the subdivision may be planned to include fewer than 15 lots so it will not come under Department of Natural Resources regulations. Houses are built, contractors or installers bid the on-site sewage system and the low bidder is usually the one who installs the system.

With no enforceable minimum standards, each installer soon learns that to make the lowest bid, he has to cut corners, and the installer who cuts the most corners is the winner. The loser is often the homebuyer or homeowner because he gets a poorly designed and installed system. Most good installers don't like this procedure and support the adoption of good on-site sewage regulations.

Subdivisions developed in this manner soon lose their attractiveness. Sewage running down the roads and odors from

large, standing pools of water soon ruin the ability of the subdivider to sell lots, the contractor to build additional homes, the installer to install additional systems and the realtor to resell homes in the area. The homeowner is unable to sell his property or to refinance his home because lending institutions won't loan or guarantee the loans. Everyone loses and the public health is impacted. With good minimum construction standards and site selection, these pitfalls can be avoided.

A sanitarian would make an on-site visit to determine the compatibility of the soil. This would occur before the subdivision is platted and would enable the subdivider to determine if the soil conditions would support an on-site system. If soil conditions and other parameters are approved, the subdivision would be approved for the selling of lots with on-site systems.

Buyers of the lots would then contact local health departments to obtain a permit. The permit would outline the minimum standards to fit the home to be built and the site. Contractors would then prepare bids using these minimum standards; all contractors would be bidding on the same specifications. The low bidder would still get the job, but no "corner cutting" would occur, and the systems would be installed to "state-of-the-art" specifications. A final inspection would be required to ensure the minimum requirements were met, and the sanitarian would sign the permit.

The subdivider would maintain the desirability of the subdivision and would sell all the lots; the contractor would build homes that would sell; the installers would install systems that continue to work; and the realtors would transact sales and resales of homes in the area. The public health of the citizens of Missouri would be protected. Everyone would win and everyone would live happily ever after!

Lyme Disease In Missouri?

Hopes That Using Polymerase Chain Reaction And Other Techniques Can Answer The Question

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

A number of researchers have conducted studies in Missouri that attempted to:

- determine whether *Borrelia burgdorferi*, the causative organism of Lyme disease, could be identified in ticks occurring in the state
- define better the erythema migrans (EM) rashes occurring in Missouri residents; and
- identify risk factors for the development of these rashes.

Some of these studies have been reported in previous editions of the *Missouri Epidemiologist* (January-February 1992 and May-June 1992). Based on their findings, it appears virtually certain that some Missouri residents have developed an EM-like rash associated with tick bites. The tick most commonly responsible for these bites has reportedly been *Amblyomma americanum*.

In some individuals, the rash seems typical of the EM rashes seen with Lyme disease in northeastern United States. However, other individuals develop rashes that would be atypical for Lyme disease. The authors of one study noted that, although allergic reactions could not be ruled out as a cause of at least some of the lesions, there were a number of observations that suggested that these rashes were infectious in origin. This same study found that, in general, patients with EM-like rash were asymptomatic except for the rash. Review of these individuals' medical records showed that influenza-like symptoms, which are frequently associated with Lyme disease, were rarely reported. However, it was noted that these patients were significantly more likely than controls to report, in association with their rash, stiff neck and fatigue, symptoms that have been specifically associated with Lyme disease in northeastern United States.¹

The question remains whether the EM-like rashes seen among Missouri residents represent Lyme disease, or whether they are due to some other disease process. On balance the evidence, direct and indirect, for Lyme disease in Missouri appears strong.

- Over 651 cases meeting the Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) surveillance definitions have been reported in Missouri since 1983. A number of these cases have had positive laboratory test results, and these results have come from different laboratories throughout the country, including the CDC laboratory. A wide variety of laboratory tests, including the enzyme-linked immunosorbent assay (ELISA), immunofluorescent assay (IFA), Western blot test (WBT) and polymerase chain reaction (PCR) have demonstrated positive results in Missouri patients. In addition, skin biopsies submitted to several experts reportedly have shown the presence of spirochetes.²
- During 1991, over 3,400 ticks were collected from sites in Missouri where patients recalled tick exposure. Darkfield microscopy done at CDC on the midgut contents of a subset of *A. americanum* ticks revealed the presence of motile organisms believed by observers to be *Borrelia*-like spirochetes.²
- *Ixodes dammini* is known to have established populations in Iowa and northern Illinois. In addition, this tick has been found in Monroe County, Illinois, which is immediately adjacent to Jefferson County, Missouri (near St. Louis).²
- While *I. dammini* has not been found in Missouri, established populations of *Ixodes scapularis* are located here. *B. burgdorferi* has been isolated from *I. scapularis*, as well as *Dermacentor*

albopictus, in Oklahoma.⁴ And, perhaps very significantly, it has recently been recommended, based on new research, that *I. dammini* be reclassified as a form of *I. scapularis*.³ Such a reclassification would vastly increase the range of the accepted vector for *B. burgdorferi* to include Missouri, as well as a number of other southern states where *I. scapularis* is present.

- Researchers in Oklahoma have also found an organism confirmed with monoclonal antibody H5332 as *B. burgdorferi* in white-footed mice. They additionally reported that ELISA testing revealed antibody to *B. burgdorferi* in 4.5 percent of 240 dogs and 11.7 percent of 489 deer.²
- Cotton mice across wide areas of the southeastern United States have been found with antibodies to *B. burgdorferi*.² A study by the U.S. Army on small mammals in Missouri is currently in progress.

While a strong case can be made for the existence of Lyme disease in Missouri, some evidence exists that seems to indicate the opposite conclusion.

- During 1991 and 1992, approximately 80 clinical specimens (including skin biopsies and skin aspirates) from 58 different patients were sent to CDC to be cultured for *B. burgdorferi*.⁵ All cultures to date have been negative for the spirochete.
- Another subset of the 3,400 ticks mentioned earlier were cultured in BSK-II media. This resulted in the detection of non-motile, spirochete-like objects which later were demonstrated to be artifacts.⁶
- Testing by CDC on Missouri cases with EM-like rash found 44 percent were positive by the standard whole-cell sonicate ELISA. However, only five percent of these individuals were positive when tested by the more specific flagellum ELISA test.¹

- The University of Missouri at Columbia (UM-C), with assistance from the Department of Health, collected approximately 3,000 ticks from major biomes around the state. No *I. dammini* were found.⁷
- Dr. Willy Burgdorfer at the National Institutes of Health (NIH) Rocky Mountain Laboratories examined over 1,000 *I. scapularis* collected from white-tailed deer in 12 Missouri counties. No evidence of the spirochete bearing his name was found.²

At present, Missouri presents a confusing picture of EM or EM-like rashes and Lyme or Lyme-like disease. This picture may potentially be clarified by a new technology that appears to hold strong promise.

The polymerase chain reaction (PCR) is a technique using repeated cycles of DNA synthesis to carry out in vitro replication of target nucleic acid sequences. This provides the basis for an extremely sensitive system to amplify and detect specific nucleic acid sequences.⁸ The keystone of the detection process is the primer sets which form the template or binding site for the DNA to be replicated. As such, they are specific to a particular DNA strand, and the result should be amplification of that strand. The use of this technique for *B. burgdorferi* DNA is made possible by the development of primer sets for *Borrelia* species, and more specifically, of primer sets for *B. Burgdorferi* subspecies.^{9,10} The primary problem with PCR is its extremely high sensitivity. Since PCR is sensitive to a very few molecules of a nucleic acid sequence, cross-contamination between specimens can very easily cause false-positive results. The reagents used in a previous clone may cause this contamination, and even the laboratory itself may become contaminated through aerosolization of previous PCR products

Several different researchers are attempting to utilize PCR to clarify the issue of Lyme disease in Missouri.

- In the summer of 1991, Dr. Dorothy Feir from St. Louis University, working with Drs. Li and Weil from Washington University in St. Louis, used PCR to examine spirochetes taken from Missouri ticks. Utilizing primers described by Rosa and Schwann⁹, they demonstrated positive results for *B. burgdorferi*. Dr. Li sequenced the DNA of one spirochetal sample from *A. americanum* and one from *D. variabilis*. She found 97 percent homology with the DNA of the B31 strain of *B. burgdorferi*. In 1992, Dr. Feir sent spirochetes from *D. variabilis*, which were positive for *B. burgdorferi*, on IFA to Dr. Richard Marconi at the NIH Rocky Mountain Laboratory. Dr. Marconi compared the spirochetes to *B. burgdorferi* using 17S rRNA-sequence analysis and found them to be analogous.¹¹
- CDC tested 1,828 *A. americanum* ticks from Bollinger, Pulaski, St. Louis and Stoddard counties using flagellum primers. Prior to testing, the ticks were merged into several pools per county. Pools from Bollinger, St. Louis and Stoddard counties were negative, but 11 of the pools from Pulaski County were positive. However, because of the high risk of contamination, the pools were retested. The results of the second testing were inconsistent. Further testing may be done some time in 1993.¹²
- In 1992, Arunika Hewadikaram, a Ph.D. candidate in entomology at UM-C, Dr. Robert Hall in the Entomology Department and Dr. Gregory A. McDonald from the Microbiology Department, demonstrated positive PCR results for *B. burgdorferi* using samples of *A. americanum* ticks collected from sites in southeastern Missouri. They collected 48 *A. americanum*, 88 *D. variabilis* and one *A. maculatum*. They used three sets of *B. burgdorferi* specific primers. The results indicated that 50 percent of the *D. variabilis* and 35 percent of the *A. americanum* were positive with the first primer set using the entire sample.

Subsamples were 70 percent and 86 percent positive with the second and third primer sets.⁷

The Department of Health hopes it will soon find a definitive answer to the questions of surrounding the presence of Lyme disease in Missouri. Without doubt, individuals in Missouri are suffering morbidity that fits the surveillance definition of Lyme disease. However, because of the difficulties surrounding clinical testing for this disease, it has been impossible to know with assurance the degree of its occurrence within the state. It is hoped that better tests will become available that will allow Lyme disease to be diagnosed with much higher levels of certainty. Until then, ongoing efforts will be made to clarify better the problem through epidemiologic surveillance and further research studies.

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(continued on page 23)

HIV/AIDS in Rural Missouri

*Liz Hagar-Mace
Bureau of AIDS Prevention*

AIDS cases reported from rural Missouri as of December 31, 1992, totalled 302, or nine percent of the state total. See Figure 1. The reported number of HIV cases in rural Missouri as of December 31, 1992, totalled 558, or 11 percent of the state total. See Figure 2. The annual increase in the number of rural AIDS cases has been 25 percent or greater and the increase in reported HIV has been about 30 percent. Estimates of HIV infections that have not been identified or reported suggest that another 1,500 to 3,000 people in rural areas may be infected. Additionally, many rural areas find that residents who have moved away are now returning home to live with their HIV disease. Their cases may have been reported from a metropolitan location or from another state. Current estimates indicate that 15–20 percent of the HIV Service Coordination program case loads have been reported with a residence in another state.

The Missouri Department of Health, Bureau of AIDS Prevention (BAP) HIV Service Coordination Program provides case management statewide for individuals infected with HIV or who have AIDS. However, in rural areas, service provision for clients is more difficult than in urban areas. Lack of service providers and funding are major barriers, along with reluctance of service providers to work with clients who are HIV-infected, geographic disbursement and poverty of clients. Rural service systems, already overburdened, are often not prepared to deal with medical and psychosocial service needs of people with HIV disease.

Various provider and consumer assessments to evaluate HIV-service needs in rural Missouri have identified transportation services, access to medical and dental care, mental health services and various housing-related services. However, money to provide services for indi-

viduals with HIV/AIDS is very limited because large metropolitan areas receive over 80 percent of the available funding leaving 20 percent for services in rural Missouri. The number of physicians, dentists, and mental health professionals practicing in rural locations is low compared to urban areas. Existing providers are reluctant to treat patients with HIV/AIDS. Many medical care providers refuse to accept Medicaid. Often in rural counties, the Division of Family Services local offices, local health departments and a community action agencies are the only available service providers. Thus, for those reluctant to use government services few or no alternatives exist.

Rural cases are dispersed throughout the state, which makes it difficult to deliver services from a central location. Wide geographic location requires transportation to available services. Many individuals with HIV/AIDS in rural Missouri drive over 100 miles each way to visit a physician and/or participate in clinical trials. Logistics of support group meetings are difficult, intensifying the social isolation of the individual with HIV/AIDS.

High poverty rates in rural areas escalate the needs of individuals with HIV/AIDS. Of the rural clients currently accessing services, estimates show that 80 percent are at or below 100 percent of the federal poverty level. In order to receive certain services, safe and affordable housing is needed. Proper nutrition is necessary. The availability of medical and dental care is essential.

Further intensifying needs and social isolation are opinions often held by rural residents. Many believe that their communities are immune from the HIV epidemic and those who are infected remain isolated. Concerns about family reputation if help is sought and feelings that you should be able to solve your own problems, keep many from seeking necessary medical care and services.

Distrust of government services and workers who get paid to help and pride or fear of being perceived as lazy or mentally ill or far worse if one seeks services create other barriers to services.

To address some of the issues facing rural residents living with HIV/AIDS, the Bureau of AIDS Prevention applied for and was awarded a Ryan White Special Projects of National Significance (SPNS) grant in July 1991. The application requested funding to reduce social isolation and improve access to health and support services for rural Missourians with HIV/AIDS.

The grant establishes Rural Resource Centers to provide a wide range of services and referrals for rural HIV/AIDS clients throughout the state. The services are provided through local Community Action Agencies (CAAs) which have a long history of community-based social service provision as well as numerous rural locations. Their programs already provide food, housing, utilities, transportation, family planning, education and vocational rehabilitation and a host of other services that rural clients living with HIV/AIDS may need. Within these agencies, information about living with HIV/AIDS and services is available for the client. Information about HIV/AIDS is also available for other rural residents accessing the CAA. See page 10 for listing of CAAs.

Emergency funds provided through the grant and available at the CAAs help provide housing, utility assistance, food, transportation, medical services and other emergency needs of rural clients with HIV/AIDS. Since CAAs already provide other similar services for rural residents it is felt that this method will help to reduce the stigma a client may feel as well as help bring on board traditional rural social service providers to help meet the increasing need of serving clients affected by HIV/AIDS. The emergency funding for services also helps to fill in the gaps on a temporary basis

while clients apply for entitlement programs.

The HIV Service Coordination program has been enhanced by the SPNS grant through the employment of four "community organizers." Three are employed through contracts with rural CAAs in Kirksville, Cape Girardeau and Joplin; and one with AIDS Project of the Ozarks in Springfield. Their job duties are multifaceted involving case management, community education, networking and creating linkages among local service providers. They have been trained as bureau-affiliated case managers and by the Red Cross as HIV/AIDS educators. They work with rural clients to assure awareness of the services available from the bureau and in the rural community, helping them to access these services as well as other medical and social services.

Community organizers and community-action agency staff have been trained regarding available state services administered under Ryan White Title II. As affiliated case managers, the community organizers do intake and assessment and approve their clients to receive Ryan White Title II services. This adds an additional entry point for rural clients into state services as the community organizers continue outreach into rural communities.

Through the work and encouragement of the community organizers, some community action agency staff have begun attending regional outstate Title II consortia meetings. Prior to submitting the first application for Ryan White Title II funding, a meeting was held in February 1991 to assess service needs in rural Missouri. Service providers represented a number of agencies and organizations who serve persons with HIV/AIDS and many individuals with HIV/AIDS attended. At that time no community action agencies were involved. Now, many are participating in regional consortia meetings. CAA staff attending rural consortia meetings also give input on their community needs (education, medical

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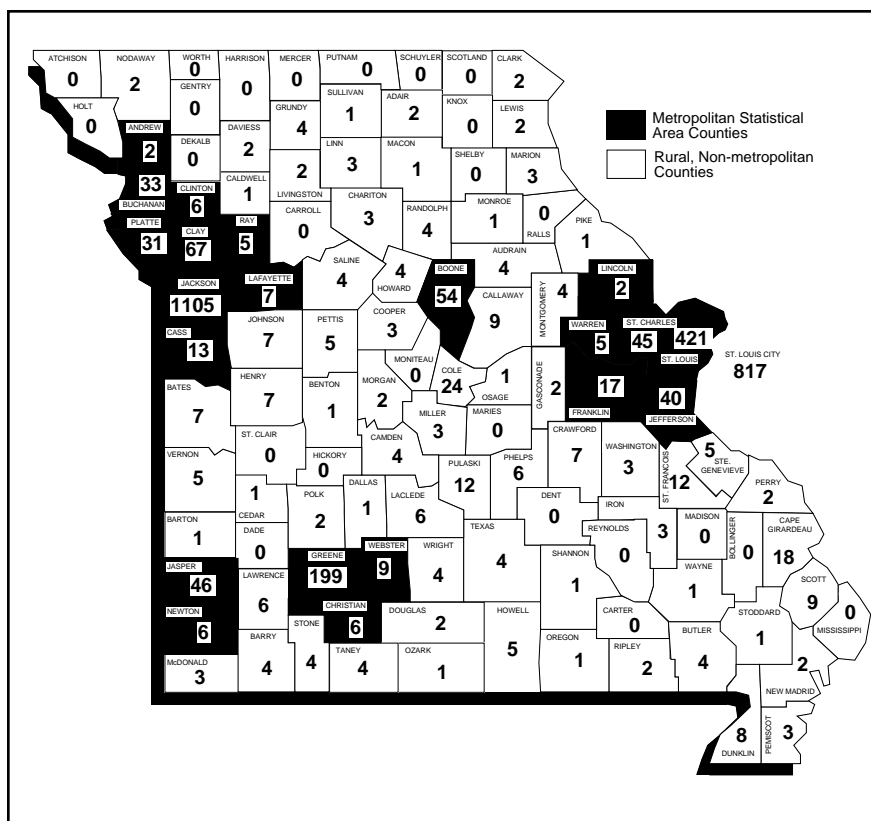


Figure 1. Cumulative reported AIDS cases in rural Missouri by county of residence as of December 31, 1992

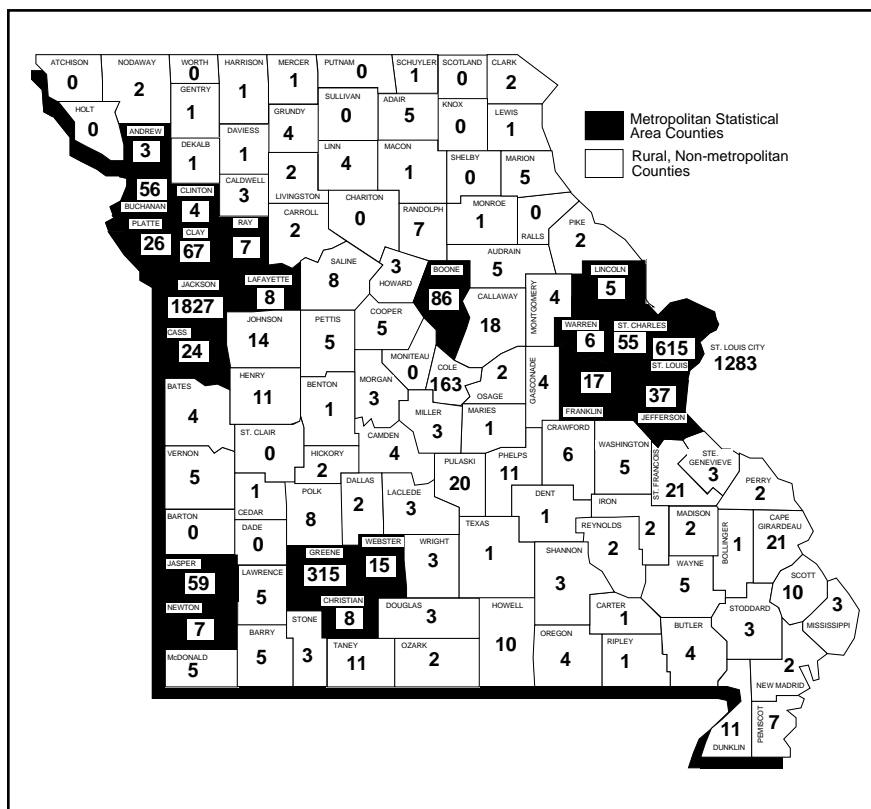
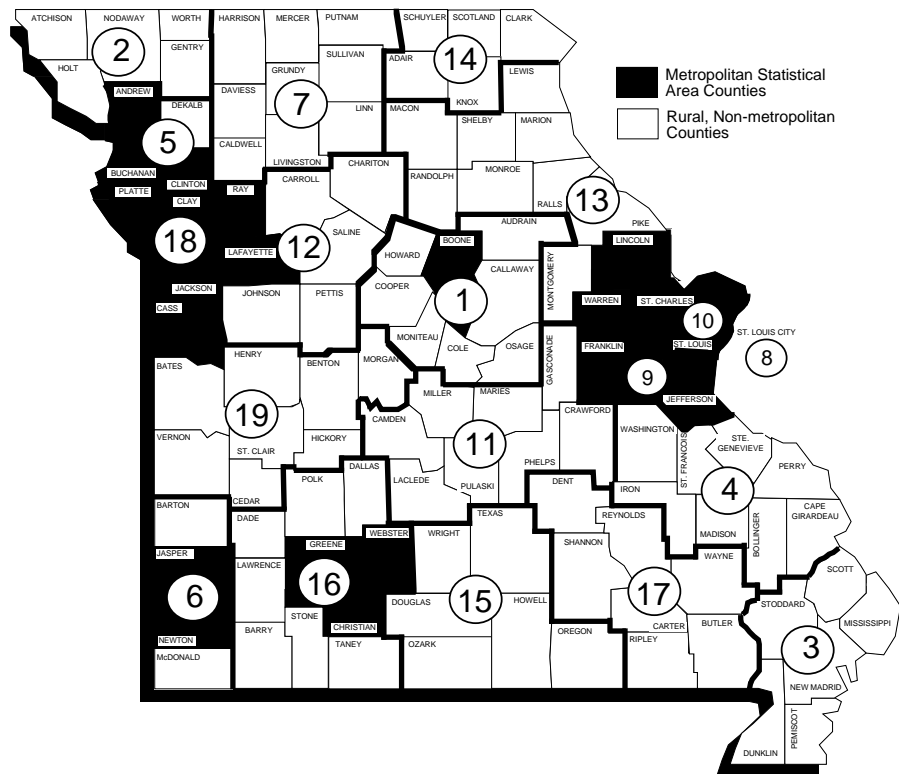


Figure 2. Cumulative HIV reports in rural Missouri by county of residence as of December 31, 1992

Community Action Agencies in Missouri

1. David Thayer/Mary Margaret Miller
Central MO Counties Human
Development Corp.
807 N. Providence
P.O. Box 1038
Columbia, MO 65205
(314) 443-8706
2. David Bell
Community Services, Inc. of NW MO
214 W. Third St., P.O. Box 328
Maryville, MO 64468
(816) 582-3113
3. Jim Link
Delta Area Economic Opportunity
Corp.
Highway 162 East, Drawer E.
Portageville, MO 63873
(314) 379-3851
4. Nancy Williams/Debbie Abbott
East Missouri Action Agency, Inc.
403 Glendale, P.O. Box N
Flat River, MO 63601
(314) 431-5191
5. Becky Steele
Economic Opportunity Corp of
Gtr St. Joseph
817 Monterey, P.O. Box 3068
St. Joseph, MO 6450-3
(816) 233-8281
6. Dayrl Andrews/Mary Hess
Economic Security Corp. of SW Area
305 Virginia, P.O. Box 207
Joplin, MO 64801
(417) 781-0352
(417) 781-0563 FAX
7. Don Warren
Green Hills Human Resources Corp.
1506 Oklahoma Ave., P.O. Box 278
Trenton, MO 64683
(816) 359-3907
8. Human Development Corp. of
Metro St. Louis
929 North Spring
St. Louis, MO 63108
(314) 652-5100
9. Ellen Dietrich
Jefferson-Franklin Community
Action Corp.
304 Locust St., P.O. Box 457
Hillsboro, MO 63050
(314) 789-2686



10. Metroplex, Inc.
7935 Page Boulevard
St. Louis, MO 63133
(314) 863-0015
11. Missouri Ozarks Comm. Action, Inc.
219 Walnut, P.O. Box 69
Richland, MO 65556
(314) 765-3263
12. Dick Gray
MO Valley Human Res Comm
Action Agency
1415 South Odell, P.O. Box 550
Marshall, MO 65340-0550
(816) 886-7476
13. Donald Patrick
North East Community Action Corp.
16 North Court Street, P.O. Box 470
Bowling Green, MO 63334
(314) 324-2231
14. Director
Northeast MO Community Action
Agency
North Highway 63, P.O. Box 966
Kirksville, MO 63501
(816) 665-9855
15. Pat Lindeman
Ozark Action, Inc.
710 East Main, P.O. Box 588
West Plains, MO 65776
(417) 256-6147
16. Carl Rosenkranz
Ozarks Area Community Action Corp.
1451 East Pythian
Springfield, MO 65802
(417) 862-4314
17. Bill Davis
South Central Missouri Comm
Action Agency
City Hall, P.O. Box 6
Winona, MO 65588
(314) 325-4255
18. United Services of greater Kansas City
1601 East 18th Street, Suite 370
Kansas City, MO 64108
(816) 221-5023
19. Charles Braithwait
West Central MO Comm Action
Agency
106 West Fourth Street, P.O. Box 125
Appleton City, MO 64724
(816) 476-2185

TEAR OUT FOR FUTURE REFERENCE

Bimonthly Morbidity Report, November/December 1992

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Bimonthly Morbidity Summary, November/December 1992

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Bimonthly Morbidity Report, January/February 1993

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Bimonthly Morbidity Summary, January/February 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Milk Sanitation Regulation in Missouri

Russell Lilly

Bureau of Community Environmental Health

Milk—"Nature's Most Perfect Food"—is also one of the world's most inspected and regulated foods. This regulation, along with improved technology, has greatly improved the safety and quality of the milk supply available to consumers in the United States.

At the turn of the 19th century, milk consumption was often associated with diseases, including typhoid fever, tuberculosis, salmonellosis, staphylococcal intoxication, septic sore throat, scarlet fever, brucellosis and others. Proper pasteurization and refrigeration have all but eliminated these diseases from our milk supply today.

Even with the vast improvements that have been made in the last decade, there have been several disease outbreaks involving milk. Many have been small outbreaks resulting from the consumption of raw (unpasteurized) milk. There have been widespread outbreaks caused by listeria or campylobacter in under-pasteurized dairy products. A huge 1985 salmonella outbreak in the Chicago area was caused by post-pasteurization contamination (over 16,000 confirmed cases with 11 deaths).

Modern milk regulation began with the 1924 Federal Model Milk Ordinance, which has evolved through 25 revisions into our current 1989 Pasteurized Milk Ordinance (PMO). The PMO is the primary document used by federal, state and local milk regulatory officials.

In Missouri, milk is a huge industry with over \$400 million in farm-milk sales. The regulatory responsibilities are divided between the Missouri State Milk Board and the Missouri Department of Health. The State Milk Board, which has loose ties with the Missouri Department of Agriculture, is a 12-member board having representatives from state and local health departments, milk companies, milk producers and consumers.

It is responsible for routine regulatory functions. The board currently contracts with Kansas City, Springfield-Greene County, St. Louis County and St. Louis City health departments, which hire approximately 25 sanitarians to inspect more than 3,000 grade A dairy farms, dairy plants, transfer stations, trucks and haulers that handle milk. These local health departments also test milk samples for bacteria counts, somatic cell levels, antibiotics, pesticides and added water. The board is also responsible for regulating the manufacturing grade (non-grade A, i.e. cheese, butter, etc.) program. They use industry fieldmen to inspect the manufacturing grade farms and hire an inspector to monitor the manufacturing grade plants.

The role of the Department of Health is to conduct surveys. At least every 24 months, each group of grade A farms and each milk plant is surveyed. These surveys serve several purposes. They provide assurance that the milk ordinance is properly interpreted and enforced, and that there is uniformity of inspection throughout the state. In addition, these surveys certify that milk produced in Missouri may be listed in the Food and Drug Administration's (FDA) quarterly Interstate Milk Shipper's List and may be exported from Missouri to other states. There are two FDA certified Sanitation Rating Officers who conduct these surveys.

An FDA Regional Milk Specialist from the Southwest Region of the FDA also

periodically makes spot-check inspections in Missouri to ensure the quality of the Missouri program.

The Milk Regulatory Program in Missouri faces many challenges for the future. Nationwide there has been a great effort to reduce the occurrence of trace antibiotic residues in the milk supply. This effort has manifested itself as Appendix N of the Pasteurized Milk Ordinance. Industry and regulatory authorities have implemented programs to comply with this new regulation; however, there is still a considerable amount of "fine tuning" work to be done. The Missouri fluid milk laws have become outdated in several respects and need revision, including an outright ban on the sale or distribution of raw milk. We face these new challenges, as well as the considerable challenge of maintaining the high standards of the inspection program, with budgets that are not increasing as fast as operation costs. This squeeze has already adversely affected the regulatory program with the loss of two dairy sanitarians in the last three years.

Given the size of the dairy industry in Missouri as well as the possible public health implications, great care should be given to preserving the integrity of our regulatory program in Missouri. Whatever changes may come in the future, this well-established program must remain viable to continue to provide the milk-consuming public with safe, wholesome products.

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Campylobacter Infection in Poultry Processing Workers, 1991-93

Mahree Fuller Skala, M.A.

Harvey L. Marx, Jr., R.S.

Bureau of Communicable Disease Control

Campylobacter infection is one of the most common bacterial causes of diarrheal illness. In Missouri, the number of reported cases has grown annually from 49 in 1980 to 614 in 1992, compared with 426 Salmonella cases in 1992. Cattle and poultry are the most frequent reservoirs for Campylobacter species. Common-source foodborne and waterborne outbreaks have been reported. This report describes a cluster of cases associated with occupational exposure in a poultry processing plant.

On February 13, 1991, four cases of Campylobacter infection were detected by the State Public Health Laboratory. All four stool specimens had been submitted by the same physician. The laboratory notified the Bureau of Communicable Disease Control and an investigation was begun.

The patients had sought medical care for diarrhea. All of them worked at the same poultry processing plant as "live hangers," removing the live birds from the transport trucks and hanging them by their feet for slaughter and processing. The plant attempted to maintain a staff of 11 "live hangers," but there was considerable turnover of employees. The "live hangers" worked during a single shift daily. The length of the shift varied depending on the number of birds to be processed that day.

A Department of Health sanitarian visited the plant to assess the situation and recommend preventive measures. The environment in the hanging area, and the workers' clothing and bodies, were found to be heavily soiled with feces and fecally contaminated feathers from excited birds. After his visit, several changes were made by plant management. A break area was established with

shower facilities and a foot-operated handwashing sink, and the plant began providing uniforms and laundry facilities on site. Construction changes made the live hanging area less accessible from the rest of the plant. Policies were developed regarding handwashing and breakroom hygiene, and a new employee orientation program addressing Campylobacter transmission was introduced. New employees were required to wear protective face masks during the first 60 days of work.

A total of 11 laboratory-confirmed cases of Campylobacter infection occurred among plant employees in 1991, plus four additional suspect cases with no laboratory testing. Five more cases have subsequently been reported with onsets from September 1992 through January 1993. Figure 1 shows the cases by date of onset and species isolated.

Nineteen (19) of the 20 cases were male. Their ages ranged from 18 to 35. None were hospitalized.

Contact with live birds was the most significant risk factor noted. Fourteen (88%) of the 16 confirmed cases had

contact with live birds. Twelve were "live hangers," one was a "live catcher" and one worked in an affiliated breeding operation. The remaining two worked as eviscerators. Only new employees appeared to be affected. Of the 19 confirmed and suspect cases whose work start dates were known, onset of illness occurred an average of 12 days after beginning work (range 3-39 days). Four of the five cases in 1992 and 1993 were tobacco users; this information was not available for the 1991 cases.

The new cases reported in December and January prompted a follow-up visit to the facility. The investigator observed incomplete compliance with the established handwashing and breakroom hygiene procedures, although adequate break time was provided (work cycle of 30 minutes on duty, 20 minutes off duty). Workers removed their goggles and masks with fecally contaminated gloves in place and entered the breakroom wearing soiled outer garments. Some were observed adjusting their soiled clothing after handwashing, then eating or smoking without rewashing. No hamper was provided for dirty uniforms, which were
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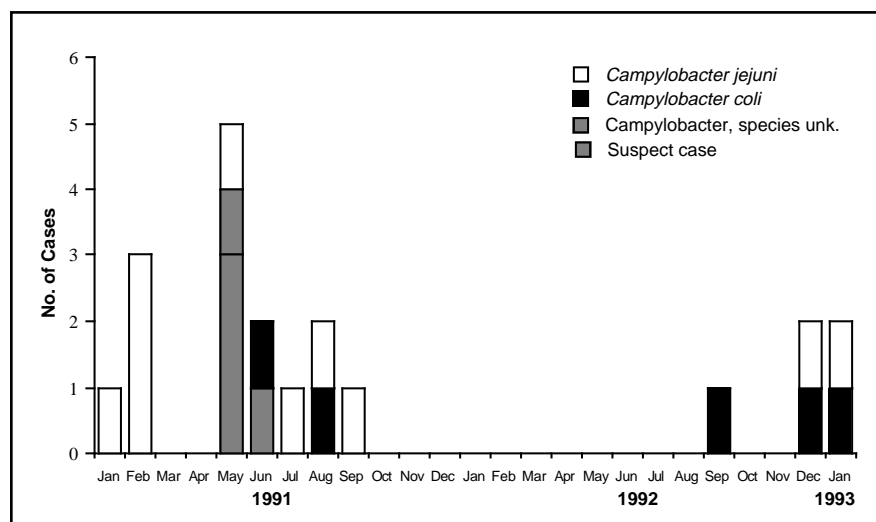


Figure 1. Campylobacter cases among poultry processing workers by month of onset and species, Missouri, 1991-93

Rule Revision: Control Measures for Food Handlers

The rule that establishes control measures for food handlers with communicable diseases has been updated to comply with current federal laws prohibiting employment discrimination. The old rule was overly broad, since it banned anyone infected with a communicable disease from handling food (although it had been enforced only in cases of foodborne illness). The new language is specific to diseases transmitted through food, and cites the signs and symptoms that necessitate exclusion from foodhandling duties. Like the old version, it requires managers to report immediately if any disease transmitted through food occurs among the employees. The rule will become effective May 6, 1993. The complete text appears here.

Editorial Comment: Two to three outbreaks of illness traced to infected foodhandlers are reported each year. Since 1989, there have been nine such outbreaks identified, affecting 249 people. In five outbreaks the source worked in restaurants, two in schools, one in a grocery deli and one as a volunteer at a church breakfast. Five of the outbreaks were due to *Staphylococcus aureus* poisoning, two to hepatitis A, one to *Shigella sonnei* and one was probably a foodborne virus. The actual total is probably much higher since there is significant under-recognition and under-reporting of foodborne illness.

19 CSR 20-20.060 Control Measures for Food Handlers

PURPOSE: *This rule establishes control measures for persons working with food products who are suspected of having a communicable disease.*

- (1) For the purpose of this rule, a communicable disease is defined as a disease transmitted through handling food.
- (2) No person infected with a communicable disease, whether actively infected or a chronic carrier, and no person with any one (1) of the signs and symptoms listed in this section, shall engage in the production, preparation, manufacture, packaging, storage, sale, distribution or transportation of food. The following signs and symptoms indicate infection with a foodborne pathogen: diarrhea, vomiting, open skin sores, boils, fever, dark urine, or jaundice unless determined not to be caused by a pathogen able to be transmitted by food. The local health authority, the director of the Department of Health or the director's designated representative may order examinations necessary to determine the presence of a foodborne infection.
- (3) Notice shall be sent immediately to the local health authority, to the director of the Department of Health or to the director's designated representative by any person responsible for the production, preparation, manufacture, packaging, storage, sale, distribution or transportation of food if any infection or disease known to be transmissible through food occurs on the premises or among the employees.
- (4) When the possibility of transmission of infection is suspected in any person engaged in the production, preparation, manufacture, packaging, storage, sale, distribution or transportation of food; the local health authority, the director of the Department of Health or the director's designated representative is authorized to require any of the following measures:
 - (A) The immediate exclusion of that person from the production, preparation, manufacture, packaging, storage, sale, distribution or transportation of food;
 - (B) The immediate exclusion of the food supply concerned from distribution and use; and
 - (C) Adequate medical examination of that person and his/her associates, including necessary laboratory testing of blood, feces, sputum, throat cultures and other bodily secretions or excreta.

Auth: sections 192.005.2, 192.020, 196.045 and 196.225, RSMo (1986). This rule was previously filed as 13 CSR 50-101.071. Original rule filed Dec. 11, 1981, effective May 13, 1982. Amended: Filed Nov. 4, 1992, effective May 6, 1993.

Food Safety Tips

- 1. Keep it safe, refrigerate.** Refrigerate foods you'll use quickly. Freeze raw meat or poultry you can't use in one or two days. Freezer should register 0°F; refrigerator, 40°F.
- 2. Don't thaw food on the kitchen counter.** Bacteria multiply rapidly at room temperature.
- 3. Wash hands before preparing food. Wash hands and utensils after contact with raw meat and poultry.** Wash cutting board or other work surfaces too. Bacteria, often present on raw foods, can spread to other foods if you don't.
- 4. Never leave perishable food out over two hours.** This includes marinating. No need to bring foods to room temperature before cooking.
- 5. Thoroughly cook raw meat, poultry and fish to at least 165°F internal temperature.** Juices should run clear and meat should not be pink. Do not partially cook food. Have a constant heat source, and never set the oven under 325°F.
- 6. Promptly refrigerate or freeze leftovers.** Divide large quantities into smaller containers for quick cooling. Reheat leftovers to at least 165°F.

Adapted from USDA Meat and Poultry Hotline

Multidrug-Resistant Tuberculosis: Cause for Recommendation of Four-Drug Treatment

Arlon Meyer, M.P.H.
Bureau of Tuberculosis Control

In cases of drug-resistant tuberculosis, patients should be considered infectious until one has obtained three properly performed negative smear examinations on properly collected specimens on separate days, in addition to which the patient is showing an appropriate clinical response. **Because it may be difficult to predict who has drug-resistant tuberculosis, four drugs are now recommended by the Centers for Disease Control and Prevention (CDC) for initial treatment unless the likelihood is very low for drug resistance.¹**

Missouri averaged over four percent drug resistance for the past six years overall. These cases were primarily in the metropolitan areas and in correctional centers. In these areas, the four-drug regimen should always be used.

Cases in rural Missouri experienced much lower than four percent resistance. For this reason, the current regimen can be used for these cases in which all patients are started with three drugs, INH, RIF and PZA, and PZA is discontinued after two months if susceptibility is confirmed.

Sputum conversions are faster with a four-drug regimen than with a three-drug regimen. Four-drug regimens have been proven very effective for patients with INH-resistant tuberculosis. The recommended four-drug regimen consists of isoniazid, rifampin, pyrazinamide and either ethambutol or streptomycin.

Along with the resurgence of tuberculosis in the United States, there has been an escalation in the occurrence of drug-resistant tuberculosis. In Missouri, 96 cases of drug-resistant tuberculosis have occurred during the period from 1987–92. Of these cases, 70.8 percent (68/96), were resistant to one antituberculosis medication, 24.0 percent (23/96) were resistant to two medications and 4.2

Table 1. Number of Drug-Resistant Tuberculosis Cases in Missouri, 1987-92

Cases with Resistance to:	1987	1988	1989	1990	1991	1992	Total
One Drug	13	9	13	11	14	8	68
Two Drugs	2	4	7	5	1*	4	23
Three Drugs	0	1	0	2	0	1	4
Five Drugs	0	0	0	1	0	0	1
Total	15	14	20	19	15	13	96

*Later developed resistance to three drugs

Table 2. Number of Drug-Resistant Tuberculosis Cases by Drug, Missouri, 1987-92

Cases with Resistance to:	1987	1988	1989	1990	1991	1992	Total
INH	8	8	9	8	11	7	51
RIF	0	0	0	1	2	0	3
SM	4	1	4	2	1	1	13
EMB	1	0	0	0	0	0	1
INH, RIF	1	2	2	3	1*	1	10
INH, SM	1	2	5	2	0	3	13
INH, RIF, SM	0	1	0	1	0	0	2
INH, RIF, ENA	0	0	0	1	0	0	1
INH, RIF, RIA	0	0	0	0	0	1	1
INH, RIF, SM, PZA, RIA	0	0	0	1	0	0	1

*Later became resistant to SM also.

EMB - Ethambutol	RIA - Rifabutin
ENA - Ethionamide	RIF - Rifampin
INH - Isoniazid	SM - Streptomycin
PZA - Pyrazinamide	

percent (4/96) were resistant to three medications. See Table 1.

These 96 drug-resistant cases accounted for 5.6 percent (96/1,703) of the total reported cases for the period. An analysis of 1992 data indicates that 61.5 percent (8/13) were resistant to one anti-tuberculosis medication and 38.5 percent (5/13) were resistant to two medications. Also, of the 1992 cases, 38.5 percent (5/13) occurred in state or federal correctional facilities, 23.1 percent (3/13) occurred in St. Louis City, 15.4 percent (2/13) occurred in St. Louis County and 23.1 percent (3/13) occurred in the outstate areas of Missouri. See Table 2.

Because of spontaneous mutations by the genome of *Mycobacterium tuberculosis*, resistance to virtually any anti-tuberculous drug may occur. The probability of a spontaneous mutation causing the development of an organism resistant to isoniazid is 1×10^6 . The probability of a mutation that leads to rifampin resistance is 1×10^8 , for streptomycin resistance it is 1×10^5 .²

Two types of drug resistance may result from genetic mutation in *M. tuberculosis*:

- **Primary resistance** is present when a drug-resistant organism is isolated from a patient who has never received treatment for tuberculosis. The most

likely cause is infection by a resistant organism acquired from a case with secondary resistance.³

- **Secondary, or acquired resistance** results when a small number of naturally occurring resistant organisms in the initial population are selected by inappropriate drug therapy. Secondary drug resistance may occur when an inappropriate treatment regimen has been prescribed, or when the patient has not been compliant in taking his or her medication.³
- **Multidrug-resistance** is resistance to two or more anti-tuberculosis medications. The most important pattern of multidrug-resistance is resistance to both isoniazid and rifampin.³

To avoid drug resistance, treatment of active tuberculosis must always consist of at least two drugs. If an insufficient number of drugs and/or an inadequate dosage(s) are employed, resistance to one or more drugs may develop.

Several factors have contributed to the increasing rates of resistant tuberculosis, including inadequate compliance with prescribed therapy, inappropriate selection of initial therapy, reduced surveillance for tuberculosis associated with a reduction of public health services and a general deterioration of the medical and social infrastructure. In addition, the HIV/AIDS epidemic is believed to have played a central role in the increased incidence of tuberculosis in recent years. An individual previously infected with tuberculosis who is subsequently infected with HIV is at greatly increased risk of developing active tuberculosis disease. An HIV-infected person who becomes infected with *M. tuberculosis* is at high risk of developing active tuberculosis some time after a very short incubation period.

Current treatment using a combination of drugs can overcome resistance to a single drug, most notably isoniazid (INH). However, once resistance to other drugs, especially first line drugs, develops, treatment failure and relapses increase significantly. Depending upon the level of resistance and the extent of

disease, resistance to both isoniazid and rifampin (RIF) will reduce the probability of a lifetime cure from over 95 percent to 50 percent or less. A patient whose tuberculosis is resistant to INH, RIF, and other first line drugs is at very high risk for treatment failure. Care for this type of patient should be provided only under a highly controlled and directed system that should include directly observed therapy (DOT).

Drug-resistant tuberculosis should be suspected when there is a:

- High likelihood of prior exposure and infection with drug-resistant tuberculosis.
- Prior history of inadequately treated tuberculosis.
- Worsening of symptoms and signs despite adherence to treatment.
- Drug susceptibility study showing resistance of the *M. tuberculosis* isolate. (It is imperative that such susceptibility studies be obtained on all initial tuberculosis isolates.)⁴

Indications that a patient is developing acquired drug resistance are:

- The patient was treated with an inadequate regimen and thus had an increased chance of secondary drug resistance.
- Sputum smears and cultures remain positive after several months of treatment.

Childhood Lead Poisoning

(continued from page 6)

the contact point for information and updates on lead poisoning prevention efforts, and to seek funding such as federal grants for the state's childhood lead prevention program. The project specialist for lead, Michael Carter, can be reached at (314) 751-6080.

REFERENCES

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- The patient fails to improve clinically, or after initial improvement, his or her clinical condition worsens.
- The patient gives a history of only taking a single drug, or of taking his or her prescribed medications intermittently.⁴

For further information, please contact the Bureau of Tuberculosis Control at (314) 751-6122.

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Homeless Intervention Project Targets Tuberculosis and Other Diseases

Arlon Meyer, M.P.H.
Bureau of Tuberculosis Control

Methods

During 1992, funding was approved by the Centers for Disease Control and Prevention (CDC) for the Homeless Intervention Project (HIP) in St. Louis City. In May and June, meetings were held by the Department of Health with representatives from the St. Louis City Health Department, the American Lung Association of Eastern Missouri and homeless shelters (Health Care for the Homeless Coalition) to discuss the project and obtain their input. A planning committee consisting of selected members of these groups was subsequently formed. This committee then made decisions regarding what the project should accomplish, how the project was to be implemented, and which shelters would be invited to participate. Out of a total of 35 shelters in St. Louis City, 14 were chosen for participation.

The planning committee emphasized the importance of providing education regarding tuberculosis to both clients and staff prior to conducting skin testing for tuberculosis infection. A decision was made to give incentives (such as personal care packets and free meal coupons for fast-food restaurants) to provide motivation to return for the reading of the skin test. Such incentives would also be used to help ensure that infected clients take their medication as prescribed. In addition, the planning committee decided to offer clients other screening services, including HIV testing, STD testing, immunizations and hypertension screening. The screenings began in August and were completed in December 1992.

Proposal

Funding for the project in the amount of \$12,500 was approved. Also, it was agreed that an outreach worker would be

provided by the St. Louis City Tuberculosis Control Program to conduct necessary follow-up activities. These resources allowed the provision of:

- tuberculin skin testing for the clients and staff of 10–15 shelters;
- chest x-rays for those with positive skin tests or symptoms of disease;
- physician evaluation services for those suspected of infection; and
- an outreach worker to conduct directly observed therapy for those homeless persons who were placed on medication(s).

Results

Skin testing of clients and staff for tuberculosis infection was conducted at 11 of the 14 identified shelters on a total of 352 persons. Of these, 72.2 percent (254) were negative, 9.9 percent (35) were positive, 1.7 percent (6) had a previous history of testing positive and 16.2 percent (57) did not return to have their test read. Of those tested, 65 percent (230) were male and 35 percent (122) were female. Of the total tested, 8.8 percent (31) were in the 0–14 age group, 9.9 percent (35) were in the 15–24 age group, 59.1 percent (208) were in the 25–44 age group, 12.5 percent (44) were in the 45–64 age group, 0.3 percent (1) were 65 or older and 9.4 percent (33) were of undetermined age. As of January 13, 1993, 54.3 percent (19) of those with positive skin tests had been x-rayed and were under medical supervision. The remaining 45.7 percent (16) had not been located.

Conclusion

A full-time outreach worker was assigned to the project in mid-November and is currently providing follow-up services.

During the testing at a shelter, the St. Louis City Health Department received additional support from shelter staff, the Health Care for the Homeless Coalition

staff and staff from the American Lung Association of Eastern Missouri. Also rapport was established with the homeless residents and staff. According to staff at the Health Care for the Homeless Coalition, the average length of stay for a homeless family is six months, and the average stay for a male is two or three years.

The project received considerable media coverage, including radio interviews and television news reports of project activities.

The Department of Health has applied to CDC for \$13,000 to continue the project in 1993. This grant would provide for PPD and syringes, educational materials, mobile x-ray services, medications and physician evaluation services.

Campylobacter Infections

(continued from page 18)

piled in the showers, making the latter inaccessible. Tobacco products were used outside the breakroom.

The investigator made a number of recommendations to help correct these problems, including:

- more intensive employee training with reinforcement by supervisory personnel;
- signs on the breakroom door to remind employees to wash their hands and remove soiled clothing;
- use of protective, non-absorbent aprons; and
- no tobacco use allowed outside the breakroom.

The plant managers have cooperated in the investigation and are willing to implement additional preventive measures. Surveillance for additional cases will continue.

Missouri Office of Rural Health

*H. Alan Welles, M.P.A.
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The Missouri Office of Rural Health was established in the Department of Health in 1990 by the 85th General Assembly. The Office of Rural Health Advisory Commission was also created by law. Appointments to the advisory commission are made by the governor.

The commission provides technical and professional consultation regarding the delivery of rural health care services. Together the Office of Rural Health and the commission are to report biennially to the governor and the General Assembly their activities, the status of rural health delivery and their recommendations.

The responsibility of the Office of Rural Health is to assume a leadership role in developing rural health initiatives and maximize the use of existing resources. The office is a central information and referral source and serves as the primary

state resource in planning, coordinating and advocating for the continued access to rural health care services. The populations of special interest to this office include the poor, the medically underserved, the medically indigent, those who are pregnant, newborns, and children and elderly undergoing medical care.

To accomplish these tasks in the most effective and efficient manner, the Department of Health has built on the accomplishments of Extension, the Area Health Education Center, the Missouri Rural Innovation Institute, the University of Missouri-Kansas City Center for Aging Studies and many other public or private agencies and individuals who have been involved or have an interest in the delivery of health care services in rural Missouri.

The Office of Rural Health Advisory Commission has been aided by seven task forces established by the Missouri Rural Innovation Institute. These task forces are made up of individuals from

throughout the state. The task forces have as their individual focus elderly health, maternal and child health, youth health, wellness and prevention, health services management, health personnel, and transportation.

At their meeting on May 24, the commission put the final touches on their report to the governor and legislature on the status of rural health in Missouri. After reviewing the recommendations of the task forces, the commission has developed recommendations to address supporting the infrastructure providing rural health services, coordinating the education of rural health care providers, providing incentives and removing specific barriers to rural practices, supporting programs focusing on disease prevention and health promotion among rural citizens and expanding transportation services in rural areas. The report is to be published and presented to the governor in April.

HIV/AIDS

(continued from page 11)

care and housing have been three of the most frequently mentioned). Some have come with valuable information about services, physicians and dentists in their regions who may be willing to treat patients with HIV. This information obtained from the CAAs is being used to develop a pilot project for for the community organizers to recruit more medical and dental providers needed in rural areas (since there are only seven physicians and one dentist throughout rural Missouri who have signed provider agreements with the bureau).

Although some CAAs may already be providing similar services such as housing, utility assistance and food, HIV/AIDS clients add an extra burden in providing services. SPNS helps provide

those resources. Training staff on basic transmission and prevention and letting them know that HIV/AIDS does exist in their communities cultivates preparedness for dealing with HIV in their rural communities. We believe that the establishment of Rural Resource Centers and the various components of the Ryan White Special Projects of National Significance grant will go a long way toward enhancing the service delivery system for rural clients with HIV/AIDS, eliminating sociocultural, financial and logistical barriers to service in rural communities throughout the state and alleviating the social isolation felt by rural residents with HIV/AIDS.

**More information about services for rural residents affected by HIV/AIDS can be obtained by calling the Missouri AIDS Information Line at
1 (800) 533-AIDS**

Lyme Disease

(continued from page 9)

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Standards for Pediatric Immunization Practices Aimed to Improve Policies and Practices

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The National Vaccine Advisory Committee recently issued its recommended Standards for Pediatric Immunization Practices. These guidelines were developed by a 35-member working group of representatives from 24 different public and private sector organizations and a variety of state and local health departments. The recommendations are approved by the U.S. Public Health Service and endorsed by the American Academy of Pediatrics (AAP).

According to Vincent A. Fulginiti, M.D., Chairman of the National Vaccine Advisory Committee, and James O. Mason, M.D., Dr.P.H., Assistant Secretary for Health and Director, National Vaccine Program, one of the key national health objectives identified for the year 2000 is to immunize 90 percent of pre-school-age children by their second birthday against diphtheria, tetanus, pertussis, poliomyelitis, measles, mumps, rubella, *Haemophilus influenzae* type b and hepatitis B. Current data suggest that less than 60 percent of children receive the recommended primary immunization series by the age of two years. Immunization coverage is notably low among young children, especially in inner cities.

In an introduction to the Standards, Drs. Fulginiti and Mason state: "By adopting the Standards, providers can begin to enhance and change their own policies and practices. It is recognized that not all providers will have the funds necessary to fully implement the Standards immediately. Nevertheless, those providers and programs lacking the resources to implement the Standards fully should find them a useful tool in better delineating immunization needs and in obtaining additional resources in the future."

Eighteen Standards Set Forth

Eighteen standards have been developed for pediatric immunization practices. These standards are recommended for use by all health professionals in the public and private sectors who administer vaccines to or manage immunization services for infants and children.

Standard 1.

Immunization services are readily available.

Immunization services should respond to the needs of patients by ensuring availability at convenient times during working days as well as weekends. Private providers who offer primary care to infants and children should always include immunization services as routine care.

In addition to the ready availability of immunization services, the vaccine supply should be adequate at all times.

Standard 2.

There are no barriers or unnecessary prerequisites to the receipt of vaccines.

Immunization by appointment only may impede vaccine delivery in both public and private settings. Thus, immunization services also should be available on a walk-in basis for routine and new patient visits. Generally, waiting time should not exceed 30 minutes.

The administration of needed vaccines should not be contingent upon enrollment in a well-baby program unless enrollment is immediately available. Children requiring immunizations only should be screened rapidly and efficiently; a primary care provider should be recommended for those that lack a caregiver.

Physical examinations and temperature measurements before immunization

should not be required if they delay or impede the timely delivery of immunizations. A reliable decision to vaccinate can be based solely on information provided by a parent or guardian and on the provider's observations and judgment about the child's wellness at the time of vaccination. At a minimum, the pre-immunization assessment should include: (1) observation of the child's general state of health, (2) parental questioning about the child's health, and (3) parental questioning about potential contraindications to vaccination. (See table on page 26.)

In public health settings, the administration of vaccines should not depend on individual written orders or on a referral from a primary care provider. Instead, standing orders should be developed and implemented.

Standard 3.

Immunization services are available free or for a minimal fee.

In the public sector, immunizations should be free or cost a minimal amount. In the private sector, the charge should include the cost of the vaccine plus a reasonable administration fee. Public and private providers that charge a fee to administer vaccines obtained through a consolidated federal contract should prominently display a state-approved sign indicating that immunization services will not be denied due to inability to pay the fee.

Standard 4.

Providers utilize all clinical encounters to screen for needed vaccines and, when indicated, immunize children.

Each encounter with a health care provider (including an emergency room visit or hospitalization) is an opportunity to determine an individual's immunization status and administer any needed vaccines. Before hospital discharge, chil-

dren should receive immunizations for which they are eligible by age and/or health status. The child's regular physician should be informed of any immunizations given. Additionally, children accompanying parents or siblings who are seeking any medical service should be screened and given any needed vaccines.

Providers in subspecialty clinics or in any specialties should pay attention to the immunization status of their pediatric patients and vaccinate them or refer them to immunization services or primary health care providers as appropriate.

Standard 5.

Providers educate parents and guardians about immunization in general terms.

Providers should educate parents and guardians in a culturally sensitive manner, preferably in their native language, about the need for immunizations, the diseases they prevent, the recommended immunization schedules, the need to receive vaccines at recommended ages and the importance of having their child's immunization record available at each visit. Parents should be encouraged to ensure that their child completes the full immunization series. Providers should answer all questions about immunization and provide parents and/or guardians with educational materials at suitable reading levels in the appropriate language.

Standard 6.

Providers question parents or guardians about contraindications and, before immunizing a child, inform them in specific terms about the risks and benefits of the immunizations their child is to receive.

Minimal acceptable screening for precautions and contraindications to immunization include questioning to elicit a possible history of adverse events following prior immunizations and determining any existing precautions or contraindications. (See table on page 26.)

The Vaccine Information Pamphlets required by law should be provided and reviewed with parents or guardians. Similar information contained in the Important Information Statements for other vaccines should be made available. Providers should ensure that parents or guardians understand what they have read and answer any questions.

Information should be provided regarding where and how to obtain medical care at all times in case of an adverse reaction following immunization.

Standard 7.

Providers follow only true contraindications.

To avoid the unnecessary deferment of needed immunizations, providers should follow the recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Committee on Infectious Diseases of the AAP, which are presented in a table that accompanies the standards. (See table on page 26.) These recommendations may vary from those contained in the manufacturers' package inserts.

Standard 8.

Providers administer simultaneously all vaccine doses for which a child is eligible at the time of each visit.

Data suggest that the simultaneous administration of childhood vaccines is safe and effective and potentially can enhance immunization coverage. If a provider elects not to administer a needed vaccine simultaneously with others, the action and rationale should be documented; an appointment should be scheduled for later administration of the vaccine.

Measles-mumps-rubella (MMR) vaccine should always be used in combined form for routine childhood immunizations.

Standard 9.

Providers use accurate and complete recording procedures.

Providers are required by law to record the vaccine given; month, day, and year of administration; the vaccine manufacturer and lot number; title and signature of vaccine administrator; and address where the vaccine was given. Additionally, providers should record on a personal immunization record card the vaccine given, the date of administration, and the name of the provider. This card should be updated at each immunization visit; parents or guardians should be encouraged to maintain a copy.

When accepting immunization record data from parents, providers should confirm that prior vaccines actually were administered either by reviewing immunization record cards or by contacting former providers and entering verified information into their records. When a provider who does not routinely vaccinate or care for children administers a vaccine, the regular provider should be informed.

Providers with manual record-keeping systems should maintain separate or easily retrievable files of the immunization records of preschool-age children to facilitate assessment of coverage as well as the identification and recall of children who miss appointments. Preschool-age children's immunization files should be sorted periodically; inactive records should be placed in a separate file. Providers should indicate in their records, or in an appropriately identified place, all primary care services that each child receives to facilitate coscheduling with other services.

Standard 10.

Providers coschedule immunization appointments in conjunction with appointments for other child health services.

Providers of immunization-only services that require an appointment should coschedule immunization appointments with other necessary health care services provided such scheduling does not create a barrier by delaying needed immunizations.

GUIDELINES FOR PEDIATRIC IMMUNIZATION: CONTRAINDICATIONS AND PRECAUTIONS

Vaccine	True Contraindications and Precautions	Not True (Vaccines May Be Given)
General (DTP/DTaP, OPV, IPV, MMR, <i>H influenzae</i> type b, HBV)	<ul style="list-style-type: none"> • Anaphylactic reaction to a vaccine contraindicates further doses of that vaccine • Anaphylactic reaction to a vaccine constituent contraindicates the use of vaccines containing that substance • Moderate or severe illnesses with or without a fever 	<ul style="list-style-type: none"> • Mild to moderate local reaction (soreness, redness, swelling) following a dose of an injectable antigen • Mild acute illness with or without low-grade fever • Current antimicrobial therapy • Convalescent phase of illnesses • Prematurity (same dosage and indications as for normal, full-term infants) • Recent exposure to an infectious disease • History of penicillin or other nonspecific allergies or fact that relatives have such allergies
DTP/DTaP	<ul style="list-style-type: none"> • Encephalopathy within 7 d of administration of DTP • <i>Precautions</i>*: Fever of $\geq 40.5^{\circ}\text{C}$ (105°F) within 48 h after vaccination with a prior dose of DTP • Collapse or shock-like state (hypotonic-hyporesponsive episode) within 48 h of receiving a prior dose of DTP • Seizures within 3 d of receiving a prior dose of DTP (see footnote regarding management of children with a personal history of seizures at any time) • Persistent, inconsolable crying lasting ≥ 3 h, within 48 h of receiving a prior dose of DTP 	<ul style="list-style-type: none"> • Temperature of $< 40.5^{\circ}\text{C}$ (105°F) following a previous dose of DTP • Family history of convulsions† • Family history of sudden infant death syndrome • Family history of an adverse event following DTP administration
OPV‡	<ul style="list-style-type: none"> • Infection with HIV or a household contact with HIV • Known altered immunodeficiency (hematologic and solid tumors; congenital immunodeficiency; and long-term immunosuppressive therapy) • Immunodeficient household contact • <i>Precaution</i>*: Pregnancy 	<ul style="list-style-type: none"> • Breast feeding • Current antimicrobial therapy • Diarrhea
IPV	<ul style="list-style-type: none"> • Anaphylactic reaction to neomycin or streptomycin • <i>Precaution</i>*: Pregnancy 	<ul style="list-style-type: none"> • None
MMR‡	<ul style="list-style-type: none"> • Anaphylactic reactions to egg ingestion and to neomycin • Pregnancy • Known altered immunodeficiency (hematologic and solid tumors; congenital immunodeficiency; and long-term immunosuppressive therapy) • <i>Precaution</i>*: Recent (within 3 mo) IG administration 	<ul style="list-style-type: none"> • Tuberculosis or positive purified protein derivative • Simultaneous tuberculin skin testing‡ • Breast feeding • Pregnancy of mother of recipient • Immunodeficient family member or household contact • Infection with HIV • Nonanaphylactic reactions to eggs or neomycin
<i>H influenzae</i> type b	<ul style="list-style-type: none"> • See “General” advisories above 	<ul style="list-style-type: none"> • None
HBV	<ul style="list-style-type: none"> • See “General” advisories above 	<ul style="list-style-type: none"> • Pregnancy

DTP/DTaP = diphtheria-tetanus-pertussis/diphtheria-tetanus-acellular pertussis; OPV = oral poliovirus vaccine; IPV = inactivated polio vaccine; MMR = measles-mumps-rubella; HBV = hepatitis B vaccine; HIV = human immunodeficiency virus; IG = immune globulin

* The events or conditions listed as precautions, although not contraindications, should be carefully reviewed. The benefits and risks of administering a specific vaccine to an individual under the circumstances should be considered. If the risks are believed to outweigh the benefits, the immunization should be withheld; if the benefits are believed to outweigh the risks (for example, during an outbreak or foreign travel), the immunization should be given. Whether and when to administer DPT to children with proven or suspected underlying neurologic disorders should be decided on an individual basis. It is prudent on theoretical grounds to avoid vaccinating pregnant women. However, if immediate protection against poliomyelitis is needed, OPV, not IPV, is recommended.

† Acetaminophen given prior to administering DTP and thereafter every 4 h for 24 h should be considered for children with a personal or with a family history of convulsions in siblings or parents.

‡ There is a theoretical risk that the administration of multiple live virus vaccines (OPV and MMR) within 30 d of one another if not given on the same day will result in a suboptimal immune response. There are no data to substantiate this.

§ Measles vaccination may temporarily suppress tuberculin reactivity. If testing cannot be done the day of MMR vaccination, the test should be postponed for 4 to 6 weeks.

Courtesy U.S. Department of Health and Human Services/Centers for Disease Control and Prevention.

Standard 11.

Providers report adverse events following immunization promptly, accurately and completely.

Parents or guardians should be encouraged to inform the provider of adverse events following immunization. All clinically significant events, including those required by law, should be reported to the Vaccine Adverse Event Reporting System (VAERS), regardless of whether or not the event is thought to be vaccine-associated. Providers should document the adverse event in the medical record when the event occurs or as soon as possible thereafter.

Standard 12.

Providers operate a tracking system.

An automated or manual tracking system of mailed or telephone messages should be established to produce reminders of upcoming immunizations and recalls for children who are overdue. In the public sector, department staff may also make home visits. For additional intensive tracking efforts, all providers should identify children at high risk of failing to complete the immunization series on schedule.

Standard 13.

Providers adhere to appropriate procedures for vaccine management.

Vaccines should be handled and stored as recommended by manufacturers. Storage and transport temperatures should be monitored daily; the expiration date for each vaccine should be noted. Providers using publicly purchased vaccine should periodically report usage, waste, loss and inventory as required by state or local public health authorities.

Standard 14.

Providers conduct semiannual audits to assess immunization coverage levels and to review immunization records in the patient populations they serve.

In both the public and private sectors, the assessment of immunization services

for preschool-age patients should include audits of immunization records or inspection of a random sample of records: (1) to determine the immunization coverage level (the percentage of children up-to-date by their second birthday), (2) to identify how frequently opportunities for simultaneous immunization are missed, and (3) to assess the quality of documentation. The results of such assessments should be discussed by providers as part of their ongoing quality assurance reviews and used to develop solutions to the problems identified.

Standard 15.

Providers maintain up-to-date, easily retrievable medical protocols at all locations where vaccines are administered.

Providers administering vaccines should maintain a protocol that, at a minimum, discusses the appropriate vaccine dosage, contraindications, recommended sites and administration techniques, and possible adverse events and their emergency management. All providers should be familiar with protocol content, location, and implementation. Vaccines can be administered in any setting (for example, schools and churches) where providers can adhere to these protocols.

Standard 16.

Providers practice patient-oriented and community-based approaches.

Public providers should seek patient input regarding their immunization needs and implement changes to provide better services. Public providers should adopt a community-based approach to immunization services that calls for reaching high coverage levels in catchment area populations and not only in the active patient populations they serve; publicity about immunization services and community outreach activities to increase demand for immunization services should be employed. Private providers should cooperate with local health officials in their efforts to assure high coverage levels throughout the community. All providers share in the responsi-

bility to attain the highest possible degree of community protection.

Standard 17.

Vaccines are administered by properly trained individuals.

Only properly trained persons should administer vaccines, although they need not be physicians or nurses. With appropriate training (including the management of emergency situations), and under professional supervision, other personnel can skillfully and safely administer vaccines.

In some areas, statutory requirements limit the administration of vaccines to licensed physicians and/or nurses, which might create barriers to immunization.

If so, legal opinion should be sought locally to determine ways to overcome this barrier.

Standard 18.

Providers receive ongoing education and training on current immunization recommendations.

Ongoing education and training should target all individuals who are involved in the administration of vaccines, the management of immunization clinics, or the support of these functions. Training and education should cover current guidelines and recommendations of the ACIP, AAP, and the American Academy of Family Physicians as well as the Standards for Immunization Practices and other sources such as manufacturers' package inserts. Providers should also receive information about national efforts to reach the year 2000 goal of 90 percent complete immunization by the second birthday.

Editorial Note: A statewide survey conducted in 1992 indicates that only 44 percent of Missouri's children receive the recommended primary immunization series by their second birthday.



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If you desire a copy of this publication in alternate form because of a disability, contact the Missouri Department of Health, Division of Administration, P.O. Box 570, Jefferson City, MO 65102 at (314) 751-6014. Hearing-impaired citizens may contact the department by phone through Missouri Relay at (800) 735-2966.



Change in Immunization Requirements for School Attendance

The Missouri school immunization law has been amended and the changes will go into effect for the 1993-94 school year. The new requirements strengthen the law with four specific provisions:

- Immunization against mumps (i.e., one dose on or after the first birthday) is now required for all students, K-12. Children who received measles/mumps/rubella vaccine will, of course, already be protected. Students who were immunized in infancy with only measles/rubella vaccine must receive mumps vaccine before the 1993-94 school year. MMR is recommended if they have not received a second dose of measles vaccine.
- The philosophical exemption to immunization has been eliminated. A medical exemption will be allowed if a licensed doctor of medicine or osteopathy

certifies on Department of Health form Imm.P.12 that either the immunization would seriously endanger the child's health or life or that the child has documentation of laboratory evidence of immunity to disease. For a religious exemption, one parent or guardian must object in writing (on Department of Health Form Imm.P.11A) to the school administrator that immunization violates the tenets or commonly-held beliefs of an organized religion of which the parent or guardian is a member.

- The period of time that students may attend school prior to being adequately immunized has been reduced. A child in noncompliance will now be excluded from school after 15 school days, rather than the previous 30 days.

- It is no longer necessary to obtain the parent or guardian's written release au-

thorizing disclosure and exchange of childhood immunization records. This will expedite obtaining immunization records and will be especially helpful in automating a state immunization registry.

The amendment to 19 CSR 20-28.010 Immunization Requirements for School Children which implements these new immunization requirements becomes effective August 1, 1993. All schools and school nurses in the state have been notified of the changes and are being encouraged to notify parents as soon as possible so required immunizations can be obtained before the 1993-94 school year begins.

Questions or concerns regarding school immunization requirements should be referred to the Bureau of Immunization at (314) 751-6133.



Expansion of CDC's AIDS Surveillance Case Definition Increases Missouri's Case Numbers

Kevin Gipson
Bureau of AIDS Prevention

Effective January 1, 1993, the Centers for Disease Control and Prevention (CDC) expanded its adult and adolescent AIDS surveillance case definition. The expanded definition emphasizes the clinical importance of the CD4+ T-lymphocyte count in monitoring HIV disease by including all HIV-infected persons with CD4+ cell counts under 200 and/or a CD4+ percent of <14. In addition, pulmonary tuberculosis, recurrent pneumonia and invasive cervical cancer have been added to the previous list of 23 AIDS-indicator diseases or conditions.

The expanded definition will reflect a more accurate count of HIV-infected individuals with severely impaired im-

mune function in the later stage of HIV disease. In Missouri, the expanded AIDS surveillance case definition increased the number of persons reported with AIDS by 19 percent. Approximately 850 persons living with HIV disease were added to the 3,214 cumulative AIDS cases reported statewide as of December 1992. See Figure 1.

The 1993 revision of the AIDS surveillance case definition represents the third major expansion of national AIDS surveillance criteria. Previous revisions to the surveillance definition were made in 1985 and 1987. Each of these revisions has reflected progress in the understanding of HIV disease, the care of HIV-infected individuals and methods developed by health departments and CDC to conduct HIV/AIDS surveillance.

Below are answers to frequently asked questions regarding the expanded surveillance case definition. **For additional information, contact the HIV/AIDS Surveillance Program at (314) 751-6438.**

Why expand the AIDS surveillance case definition?

The objectives of the revised definition are to simplify the classification and reporting process, to be consistent with current standards of medical care for HIV-infected persons, to better categorize HIV-related morbidity and to record more accurately the number of persons with severe HIV-related immunosuppression.

What is the basis for using the CD4+ cell count as a criterion for the definition?

The CD4+ T-lymphocyte plays a key role in defending the body against infection and is the primary target for HIV infection. Studies have shown a strong association between the development of life-threatening opportunistic illnesses and the number of CD4+ cells. As the number of CD4+ cells decreases, the risk and severity of illness increases.

Measures of CD4+ cells have also become an integral part of medical management of HIV disease. Different prophylaxis and therapies have been shown to be most effective within certain levels of immune dysfunction.

(continued on page 2)

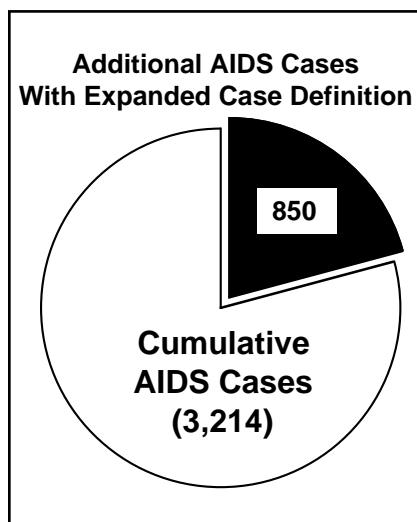


Figure 1. Cumulative reported AIDS cases in Missouri as of December 1992.

Inside this Issue...

Page	
5	HIV Counseling and Testing
6	HIV Service Coordination and Client Services
8	HIV/AIDS Health Education and Risk-Reduction Resources
10	Caring for HIV-Infected Persons
17	TB and HIV Infection
20	First Decade of AIDS in Missouri
26	HIV in Women

How does the 1993 revised HIV-classification system differ from the 1986 system?

The 1993 revised CDC classification system categorizes persons on the basis of clinical conditions associated with HIV infection and CD4+ cell counts. The system is based on three ranges of CD4+ counts and three clinical categories, represented by a matrix of nine mutually exclusive categories. See Table 1. The 1986 classification system was based on clinical disease criteria only. The revised system provides a framework for educating health care providers about the clinical and immunologic manifestations of HIV infection.

Why were pulmonary tuberculosis, recurrent pneumonia and invasive cervical cancer added to the definition?

The addition of these three conditions to the list of AIDS-indicator diseases is based on the following brief summary. A more detailed rationale is provided in CDC's 1993 "Revised Classification System for HIV Infection and Expanded Surveillance Case Definition for AIDS Among Adolescents and Adults," *MMWR*, December 18, 1992, Vol. 41, No. RR-17.

Pulmonary Tuberculosis

Persons coinfecting with HIV and tuberculosis (TB) have greater risk of developing active TB compared to persons without HIV infection. Recent data suggests that HIV-infected individuals are as likely to present with pulmonary TB as with extrapulmonary disease, which was added as an AIDS-indicator disease in 1987. In addition, pulmonary TB in HIV-infected persons is often a sentinel event that heralds the onset of other opportunistic illnesses.

Recurrent Pneumonia

Multiple studies indicate an increased risk of pneumonia among immunosuppressed HIV-infected persons. Other studies indicate increased mortality from pneumonia attributable to HIV infection. The relative risk for repeated epi-

Table 1. 1993 revised classification system for HIV infection and expanded AIDS surveillance case definition for adolescents and adults*

CD4+ T-cell categories	Clinical categories		
	(A) Asymptomatic, acute (primary) HIV or PGL [†]	(B) Symptomatic, not (A) or (C) conditions	(C) AIDS -indicator conditions
(1) $\geq 500/\mu\text{L}$	A1	B1	C1
(2) 200-499/ μL	A2	B2	C2
(3) $<200/\mu\text{L}$ AIDS-indicator T-cell count	A3	B3	C3

* The shaded sections illustrate the expanded AIDS case definition
[†] PGL = Persistent Generalized Lymphadenopathy

sodes of pneumonia is as great as that seen for most of the conditions included in the current AIDS definition. Finally, recurrent pneumonia has been an AIDS-indicator illness for HIV-infected children less than 13 years of age since 1987.

Invasive Cervical Cancer

Epidemiologic evidence strongly suggests an association between HIV infection and the increased prevalence of cervical dysplasia, the precursor to cervical cancer. Available data suggest that HIV infection may adversely affect the clinical course and treatment of cervical dysplasia and cancer. The addition of cervical cancer also underscores the need to identify women who are infected and

to provide routine gynecologic care for these women.

Will the expanded surveillance definition more fully represent persons, including women and injection drug users, with severe HIV disease?

Yes. According to CDC, the incorporation of a CD4+ count under 200 in the surveillance definition is a direct measurement of immunosuppression. HIV-infected persons who experience a range of illnesses not specified as AIDS-indicator conditions, and who have evidence of severe immunosuppression based on CD4+ counts under 200, are now reportable as having AIDS.

NOW AVAILABLE

1993 Provider Manual

This manual describes the comprehensive support services available statewide for eligible persons with HIV/AIDS and contains invoicing information for health care providers who supply such services.

Bureau of AIDS Prevention 1992 Annual Report

This report to the legislature lists the Bureau of AIDS Prevention's activities and funding sources for 1992.

**To obtain a copy, contact the Bureau of AIDS Prevention at
(314) 751-6438.**

CD4+ Cell Counts Required for CDC Reporting

*Kevin Gipson
Bureau of AIDS Prevention*

In anticipation of the Centers for Disease Control and Prevention (CDC) expanding its AIDS case definition to include HIV-infected individuals with a CD4+ count of <200 and/or a CD4+ percent of <14, the Department of Health amended its rule to require reporting of CD4+ lymphocyte counts on persons with HIV infection. The emergency amendment became effective October 12, 1991, and became a permanent addition to the communicable disease reporting rule (19 CSR 20-20.020) on February 6, 1992. This rule amendment subsequently resulted in the Department of Health obtaining CD4+ counts on 3,046 (57%) of the individuals reported with HIV infection in Missouri.

Because of Missouri's foresight in anticipating the change in the AIDS case definition, the department was able to add 842 new AIDS cases promptly when the new definition took effect on January 1, 1993. This addition of cases was made possible because Missouri had required, since October 25, 1987, the reporting by name of all persons newly diagnosed with HIV infection.

Missouri's anticipation of the expanded AIDS case definition and its advanced planning toward that change also impacted federal funding allocations. In 1990, Congress passed the Ryan White Comprehensive AIDS Resource Act. The Ryan White Act allocates funds under four separate titles. For three of the titles, the number of reported AIDS cases is used in formulas for allocating funds among states and cities. Because of the addition of CD4+ counts as a reportable condition in combination with named HIV reporting, the two metropolitan areas were over the federally established threshold of 2,000 AIDS cases by March 31, 1993, to qualify them for Title I of the Ryan White Care Act. This will result in approximately

one million federal care dollars being allocated to each area in 1994. See related articles on page 4 of this issue.

The incorporation of the CD4+ count into the CDC case definition has several advantages for surveillance. The CD4+ lymphocyte count provides a more objective guide to AIDS diagnosis (e.g., HIV-infected persons with CD4+ lymphocyte counts <200 have AIDS); it adds simplicity (e.g., patients already known to be infected with HIV may be diagnosed with AIDS on the basis of a single laboratory test); and because of the CD4+ count, AIDS surveillance data will better reflect the extent of severe immune suppression due to HIV infection in the population (e.g., a decrease in the number of CD4+ lymphocytes correlates with an increase in the risk and severity of HIV-related opportunistic infections, cancers and other manifestations of HIV-induced immunodeficiency).

CD4+ lymphocytes (T-helper lymphocytes) are the primary target of HIV because of the virus's affinity for these cells' CD4+ surface markers. CD4+ lymphocytes coordinate a number of important immune system functions. Loss of these functions results in a progressive impairment of the immune response.

The CD4+ lymphocyte count refers to the absolute number of CD4+ cells per cubic millimeter of blood. The measurement of absolute CD4+ T-cells in whole blood is the product of three laboratory techniques: the white blood cell (WBC) count; the percentage of WBC's that are lymphocytes (differential); and the percentage of lymphocytes that are CD4+ T-cells. Calculating the CD4+ lymphocyte count requires hematologic measurements (WBC count and lymphocyte differential) plus a cytometry measurement (the CD4+ percent of total lymphocytes).

Midwest AIDS Training and Education Center (MATEC)

*Theodore Northup
Bureau of AIDS Prevention*

The mission of the Midwest AIDS Training and Education Center (MATEC) is to educate health professionals on HIV/AIDS prevention and treatment. The program, run jointly by the Bureau of AIDS Prevention and the University of Missouri-Columbia School of Medicine, works in close cooperation with the Washington University AIDS Clinical Trials Unit in St. Louis and the Kansas City AIDS Research Consortium. MATEC focuses on clinical training for primary care physicians, physician's assistants, nurse practitioners and other nurses, dentists and dental hygienists.

The following articles appearing in this issue, "What Every Physician Can Do To Help Stop the HIV/AIDS Epidemic" on page 15, "Kansas City AIDS Research Consortium Launches Two Programs to Impact Treatment for Area HIV/AIDS Patients" on page 16 and "HIV in Women" on page 26, provide some insight to the information generated and made available on AIDS research and training through Washington University AIDS Clinical Trials Unit, the Kansas City AIDS Research Consortium and the MATEC program.

Medical professionals interested in training through this program should contact Susan Wightman at (314) 362-2418 or Gary Johnson at (816) 236-5366.

Kansas City Metropolitan Area Becomes Title I

Reprinted from HIV News and Statistical Report, a publication of the Kansas City Health Department, HIV/AIDS Program.

The number of AIDS cases reported in the Kansas City metropolitan area has exceeded 2,000, meaning that Kansas City now qualifies as a Ryan White Title I city. The large number of cases in this area indicates the tremendous scale of the AIDS epidemic here, but also brings some hope that Kansas City will soon qualify for additional funding to provide care services to persons infected with HIV. Becoming a Title I city may make Kansas City eligible for an additional one million dollars or more for HIV/AIDS care and treatment. These monies would become available to the Kansas City metropolitan area through the federal Ryan White Care Act. In addition, the Kansas City Ryan White Care Consortium will be expanding to include Clinton and Lafayette counties in Missouri and Johnson, Wyandotte, Leavenworth and Miami counties in Kansas.

Local and state health department officials have devoted themselves, over the past several months, to tracking AIDS cases that were already in existence but as of yet unreported. Their efforts, and the cooperation of Kansas City's health care community, were largely responsible for Kansas City's qualifying for this additional funding. One factor that increased the number of local AIDS cases was the revised AIDS-case definition which went into effect on January 1 of this year. This new definition added about 250 new AIDS cases to the statistics in the Kansas City area. Another factor was the inclusion of AIDS-case reports from the six new counties added to the Kansas City metropolitan area.

Local programs that provide care services for HIV-infected persons have been receiving about 1.4 million dollars annually in Ryan White funds. This money, however, has proven inadequate in meeting the needs of persons infected with HIV in that area. Last year, the Kansas City Ryan White Care Consortium had

to reduce home care, nutrition and housing referrals due to an increase in demand for these services. The new Title I monies will help to improve this situation.

The exact amount of new funding that will become available to the Kansas City area will depend upon how much Congress approves for spending this year. Final and official certification that Kansas City now has over 2,000 reported AIDS cases is still pending from the Centers for Disease Control and Prevention.

The Kansas City HIV/AIDS Program and the entire Kansas City Ryan White Care Consortium would like to extend its thanks to all those who have assisted Kansas City in reaching this goal. While no one is happy that there are now over 2,000 AIDS cases in the Kansas City area, this high number will translate into much improved services for those persons whose lives have been affected by HIV/AIDS.

St. Louis Becomes Title I City

*Deborah Butler
St. Louis Metropolitan AIDS Program*

In December 1992, the St. Louis Metropolitan AIDS Program set a goal to qualify for Title I funds of the Ryan White Care Act. Title I funds are allocated to metropolitan areas that have reported to the Centers for Disease Control and Prevention more than 2,000 cumulative AIDS cases. Title I provides financial assistance to support a continuum of outpatient and support services. The goal was to identify 500 unreported AIDS cases in our standard metropolitan statistical area by March 31, 1993. This would not be an easy feat, considering the historical resistance to reporting. The current level of active surveillance would not provide a yield high enough to reach the goal by the

deadline, so changes would have to be made.

After several planning meetings the following strategies were developed:

- Get the community involved and provide funds for care.
- Identify community leaders who would advocate AIDS reporting among health care providers who were resistant.
- Meet with AIDS service organizations to elicit their support.
- Send letters to all the infectious disease physicians explaining Title I and the benefits to the affected population.
- Spend time only on high yield activities.
- Target Catholic hospitals, who had historically under reported.

- Meet with Illinois representatives to encourage active reporting of cases from Illinois part of metropolitan area.
- Elicit cooperation and support from the Regional Hemophilia Center.
- Focus on those physicians who were not in compliance with reporting laws and elicit their cooperation.
- Audit medical records at numerous hospitals.
- Concentrate on laboratory-based reporting of CD4+ counts.

Through these efforts, and most importantly, the community's involvement, the St. Louis metropolitan area became eligible for about one million dollars in federal funds. The funds will become available in 1994 to provide health and support services for more than 2,000 AIDS patients in the St. Louis Standard Metropolitan Statistical Area.

HIV Counseling and Testing Reorganized Into Regions

Sharon Louise
Bureau of AIDS Prevention

Because of a nine percent cut in prevention funding for 1993 from the Centers for Disease Control and Prevention, the Bureau of AIDS Prevention was forced to announce in December 1992 the elimination of monetary support for pre-test counseling, phlebotomy and post-test counseling in all local health departments. Subsequently, there was sufficient national concern regarding the prevention cuts that a partial reinstatement of funds was authorized in March 1993.

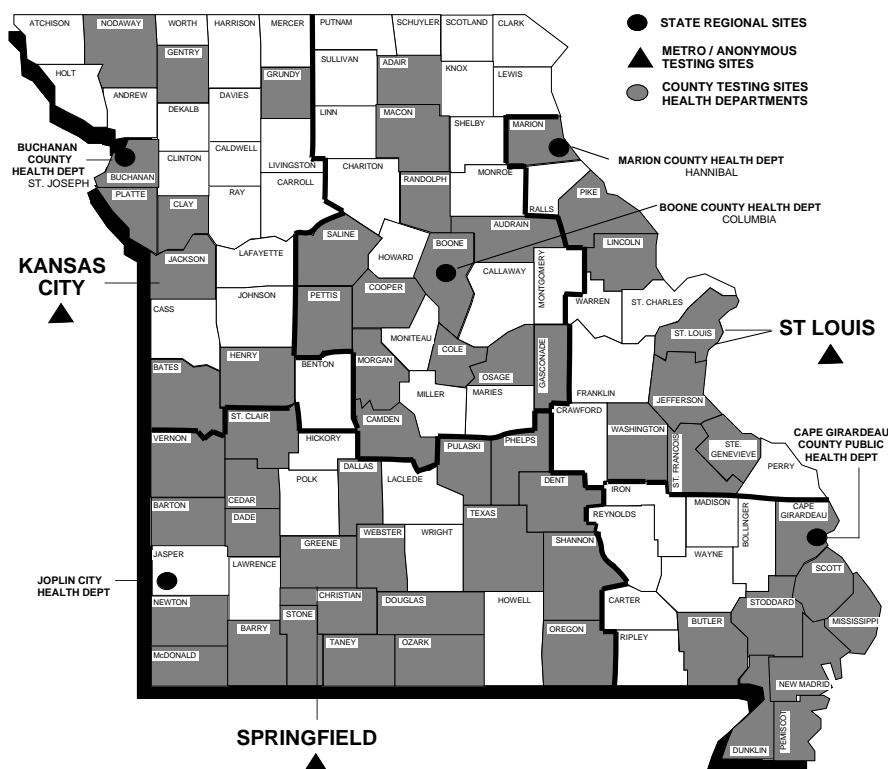
Three metropolitan testing sites and five regional sites were chosen to receive the partial reinstatement of funds. See the map and listing on this page for the location of these sites and the Missouri counties for which each is responsible.

Missouri's largest metropolitan testing sites, Kansas City, St. Louis and Springfield, were chosen because they report the greatest number of identified HIV positives. These cities also operate Missouri's three designated anonymous testing sites.

Regional sites in St. Joseph, Joplin, Columbia, Hannibal and Cape Girardeau were chosen to maintain support for testing services in areas of significant HIV morbidity outside the three metropolitan areas. Regional testing sites provide the best alternative to maintain counseling and testing services accessible to all counties.

The five regional sites will receive funds according to a formula based on each region's population and cumulative HIV incidence. Testing at all sites will continue to emphasize the identification of individuals at high risk for HIV infection.

Further information on HIV counseling and testing services can be obtained by calling the Bureau of AIDS Prevention at (314) 751-6438 or one of the HIV counseling and testing sites listed.



Missouri HIV Counseling and Testing Sites

Central Region

Columbia-Boone County Health Department
600 East Broadway
Columbia, Mo 65205
(314) 874-7345

Kansas City Region

Kansas City Health Department STD Clinic
2301 Locust
Kansas City, MO 64108
(816) 474-4901

Northeast Region

Marion County Health Department
304 Willow
Hannibal, MO 63401
(314) 221-1166

Northwest Region

St. Joseph Department of Health and
Community Services
403 City Hall
11th & Frederick
St. Joseph, MO 64501
(816) 271-4725

St. Louis City Region

St. Louis City Division of Health
634 N. Grand, Suite 436
St. Louis Mo 63103
(314) 658-1159

Southeast Region

Cape Girardeau County Public
Health Center
1121 Linden Street
Cape Girardeau, MO 63701
(314) 335-7846

Southwest Region

Joplin City Health Department
513 Kentucky Avenue
Joplin, MO 64801
(417) 623-6122

Springfield Region

Springfield-Greene County Public
Health Center
227 E. Chestnut Expressway
Springfield, MO 65802
(417) 864-1686

Service Coordination and Client Services Take An Innovative Approach to Care

Larry Libbus
Jody Russell
Bureau of AIDS Prevention

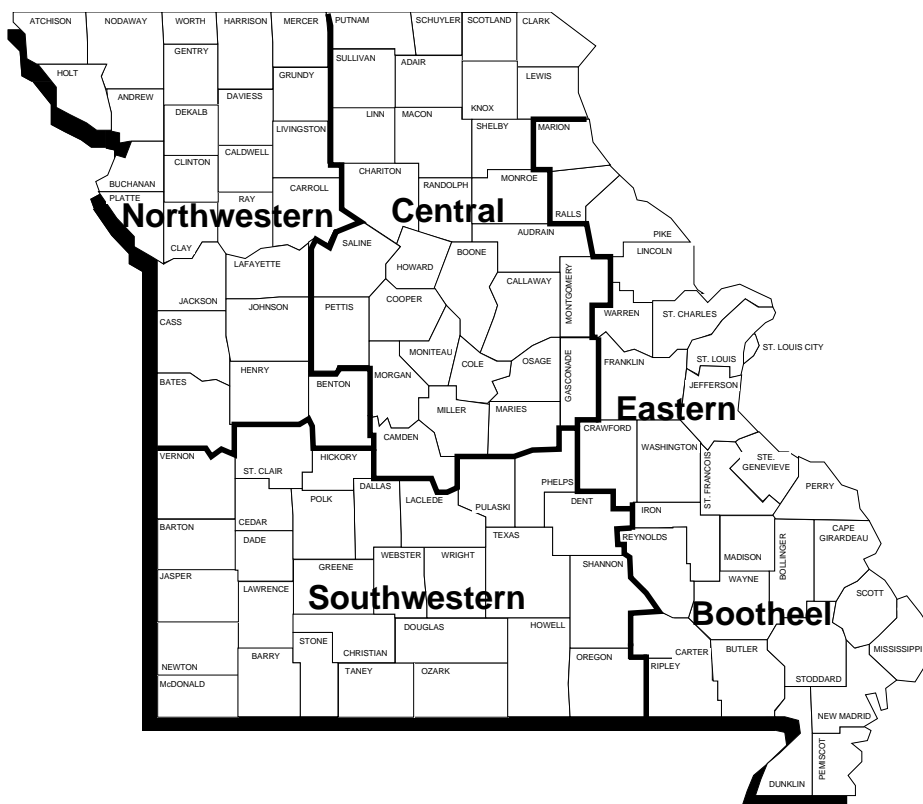
The Bureau of AIDS Prevention's Service Coordination Program provides assistance in locating, expediting and coordinating medical and psychosocial services to those with HIV and AIDS. In May 1992, the Service Coordination Program received one of only three Association of State and Territorial Health Officials (ASTHO) Vision Awards. ASTHO's Vision Award, Achieving Excellence in Public Health Through Innovation, honors outstanding state health department programs and initiatives that represent a new or creative approach in addressing a public health management issue. The Service Coordination Program also received the Health Care Financing Administration national award for outstanding contributions to health care and support services for persons living with HIV infection and AIDS.

Partnerships with state, local and private agencies have been established and continue to grow for a stronger network of services available to HIV/AIDS clients. Coordination and training of registered nurses and social workers occurs through a network of regional teams located across Missouri. See map and listing on this page.

Since its inception, the Service Coordination Program has served over 2,500 individuals, with an active caseload of approximately 1,200 per month. Through the program, service coordinators assess the needs of their clients, facilitate their referral into entitlement programs, locate providers and authorize medical and psychosocial services through the bureau's Client Services Program.

The Client Services Program coordinates the purchase of services for persons with HIV who may not have private

(continued on page 7)



Service Coordination Regions

Central Region

Columbia Area Health Office
800 N. Providence, Suite 210
Columbia, MO 65203
(314) 882-9750

Northwestern Region

Raytown Area Health Office
5105 Blue Ridge Blvd., Suite 111
Raytown, MO 64133
(816) 353-9902

Southwestern Region

Southwestern District Health Office
1414 West Elfindale
P.O. Box 777
Springfield, MO 65807
(417) 895-6900

Eastern Region

Eastern District Health Office
Two Campbell Plaza
59th and Arsenal, Suite 200
St. Louis, MO 63139
(314) 781-7825

(Bootheel Office)

Southeastern District Health Office
2875 James Blvd.
Poplar Bluff, MO 63901
(314) 840-9720

(continued from page 6)

or public health insurance coverage. Since 1987, services have been purchased for over 3,000 individuals. Funding for some of these services comes from Title II of the Ryan White Comprehensive AIDS Resources Emergency (CARE) ACT of 1990. These services include physician services, home care, mental health, dental care and nutritional services as well as transportation and medications.

The Ryan White CARE Act distributes funds by way of a statewide consortium that has a St. Louis, Kansas City and Outstate branch. Regional consortia meetings are open to the public and seek input from providers and consumers on services that should be offered in the region. Decisions about services offered statewide are made by an advisory group consisting of four members representing each of the consortia branches.

Additional services are funded by a grant called Special Projects of National Significance through the Health Resources Service Administration. The grant established a community network between the bureau, rural AIDS projects and Missouri's community-action agencies. This network ensures short-term assistance for services such as telephone, rent, utility, food, transportation and miscellaneous expenses.

Long-term, tenant-based housing assistance for low-income persons living with HIV and AIDS may be provided through the Housing Opportunities for Persons Living With AIDS formula grant from the Department of Housing and Urban Development. Missouri's community-action agencies can provide rent, mortgage and/or utility subsidies for eligible individuals as approved by bureau service coordinators.

Information regarding services and eligibility criteria can be obtained by calling the Client Services Program at (314) 751-6438; or by calling one of the regional service coordination offices listed on page 6.

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	Jan 93	Feb 93	Total YTD
Specimens Tested	8,694	8,706	17,400
Initial (percent)	68.3%	67.4%	11,806
Repeat (percent)	31.7%	32.6%	5,594
Specimens: Unsatisfactory	88	87	175
HT Borderline	397	462	859
HT Presumptive	13	25	38
PKU Borderline	15	8	23
PKU Presumptive Positive	0	0	0
GAL Borderline	14	15	29
GAL Presumptive Positive	3	1	4
FAS (Sickle cell trait)	89	84	173
FAC (Hb C trait)	27	35	62
FAX (Hb variant)	9	16	25
FS (Sickle cell disease)	2	3	5
FSC (Sickle C disease)	2	5	7
FC (Hb C disease)	0	0	0

	Mar 93	Apr 93	Total YTD
Specimens Tested	10,576	9,894	37,870
Initial (percent)	68.1%	65.6%	25,499
Repeat (percent)	31.9%	34.4%	12,371
Specimens: Unsatisfactory	90	106	371
HT Borderline	741	575	2,175
HT Presumptive	22	19	79
PKU Borderline	25	27	75
PKU Presumptive Positive	3	0	3
GAL Borderline	18	14	61
GAL Presumptive Positive	3	6	13
FAS (Sickle cell trait)	101	102	376
FAC (Hb C trait)	35	26	123
FAX (Hb variant)	17	16	58
FS (Sickle cell disease)	3	3	11
FSC (Sickle C disease)	1	2	10
FC (Hb C disease)	0	0	0

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

HIV/AIDS Health Education/Risk-Reduction Resources

The Bureau of AIDS Prevention's Health Education/Risk Reduction Program targets persons at risk for HIV infection with messages aimed at reducing their risk. The program helps those persons already infected to reduce their risk of transmitting the virus to others.

The goals of the Health Education/Risk Reduction Program are:

- Reduce the spread of HIV infection by directing culturally sensitive risk-reduction messages to persons engaging in high-risk behaviors.
- Provide information to persons already infected in an effort to help them maintain their health and protect the health of others.
- Provide information to the general public in an effort to increase awareness of the risk of HIV infection, reduce the myths surrounding HIV and increase the general public's compassion for and awareness of those with HIV infection and AIDS.

The program, in cooperation with local health departments, uses federal dollars to contract with community-based organizations for the purpose of providing HIV/AIDS education. The following list of community-based organizations includes only those under contract with the Bureau of AIDS Prevention.

AIDS Speakers Bureau

The Bureau of AIDS Prevention, through a contract with the St. Louis Bi-State Chapter of the American Red Cross, provides a statewide speakers bureau to provide HIV risk-reduction education to those areas of the state not covered by the community-based organizations listed. The speakers bureau conducts presentations to schools, civic groups, businesses, churches and other community groups.

**The speakers bureau can be reached by calling:
(800) 245-2559**

Community-Based Organizations (CBOs)

COLUMBIA/BOONE COUNTY

Columbia/ Boone County Health Department

P.O. Box N, 600 E. Broadway
Columbia, MO 65205
(314) 875-5910

Provides HIV and risk-reduction education in Boone and surrounding counties.

JASPER/NEWTON COUNTIES

Four State Community AIDS Project

P.O. Box 3476
Joplin, MO 64803-3476
(417) 624-1250

Maintains ongoing HIV/AIDS education for the region surrounding Joplin. This project offers volunteer training, a resource library, a newsletter and community HIV/AIDS education in schools and other organizations.

KANSAS CITY

Black Health Care Coalition

V.A. Hospital
4801 Linwood
Kansas City, MO 64132
(816) 861-4700

Conducts "Train the Trainer" workshops and a public service announcement campaign targeting minority professionals, school officials and ministers with minority congregations.

Gay & Lesbian Services Network

P.O. Box 32592
Kansas City, MO 64111
(816) 561-9717
(816) 374-5844 (answering machine)

Provides information and education about HIV/AIDS risk-reduction to gay and bisexual men.

Good Samaritan Project

3030 Walnut
Kansas City, MO 64108
(816) 561-8784

Targets adolescents located in juvenile justice facilities and other youth at high risk for HIV/AIDS. In addition, the "Teens Tap" program provides trans-

mission and risk reduction education to youth nationwide. They can be reached at (800) 234-TEEN (8336).

Guadalupe Center, Inc.

2641 Belleview
Kansas City, MO 64108
(816) 561-6885

Provides education programs targeting the Kansas City Hispanic community. The center provides programs for both adults and youth in English and Spanish.

Heart of America Indian Center

1340 E. Admiral Blvd.
Kansas City, MO 64106
(816) 421-0039

Provides culturally-sensitive and language-specific HIV/AIDS education to Native American youth.

Kansas City Free Health Clinic

5119 E. 24th Street
Kansas City, MO 64127
(816) 231-8895

Provides risk reduction education to intravenous drug users in correctional and rehabilitation facilities. Provides in-service education to staff in those facilities.

Samuel U. Rodgers Health Center

825 Euclid
Kansas City, MO 64124
(816) 474-4920

Targets inner-city residents in their educational efforts to reduce the spread of HIV. They work through their Community Health Center and Prenatal Clinic as well as local churches and ethnic festivals.

Swope Parkway Comprehensive Health Center

4900 Swope Parkway
Kansas City, MO 64130
(816) 923-5800

Works specifically with the black population of Kansas City through their Health Ministry Program and Infant Mortality Prevention Program. The center also provides education to Kansas City's homeless population.

ST. LOUIS

Blacks Assisting Blacks Against AIDS (BABAA)

4624 Delmar

St. Louis, MO 63108

(314) 768-2502

BABAA seeks to reduce high-risk behavior among black gay males in the St. Louis area. They conduct HIV/AIDS education through "house parties," street outreach and ongoing group sessions with the targeted population.

Lutheran Family and Children Services

4625 Lindell Blvd., Suite 501

St. Louis, MO 63108

(314) 361-2121

Provides HIV/AIDS education to homeless persons and other economically disadvantaged individuals. This CBO also works closely with African-American churches with a special emphasis on educating youth ages six through 12.

New Lifestyles Program

4219 Laclede

St. Louis, MO 63108

(314) 531-5391

Provides one-on-one HIV/AIDS education to clients as part of their overall program to help those arrested for prostitution develop a new life-style.

Northside AIDS Outreach

3540 Marcus Street

St. Louis, MO 63115

(314) 389-6817

Targets family members of prisoners and those members of the community not encompassed by traditional community groups.

St. Louis Effort for AIDS

3540 Marcus Street

St. Louis, MO 63115

(314) 389-6817

Fields three separate programs in the St. Louis area: minority outreach, gay outreach and a newsletter and hotline. Each program targets specific audiences with risk-reduction support and education.

Urban League of Metropolitan

St. Louis

3701 Grandel Square

St. Louis, MO 63108

(314) 371-0040

Targets minority youth, ages 12 through 23, with its Health Improvement Project (HIP). HIP is a peer-educator program which includes assertiveness training and one-on-one education to youth at risk.

SPRINGFIELD/GREENE COUNTY

AIDS Project of the Ozarks

1722-LL S. Glenstone

Springfield, MO 65804

(417) 881-1900

Places special emphasis on youth awareness and behavior modification with regard to the connection between drug abuse, unsafe sex practices and contracting HIV. They also maintain a regional hotline and information service.

The Centers for Disease Control and Prevention also provides a variety of educational resources to the public through the National AIDS Information Clearinghouse. Call (800) 458-5231, Monday through Friday, 8:00 a.m. to 5:00 p.m. EDT.

HIV/AIDS Clinical Trials

AIDS Clinical Trials Unit
Washington University
School of Medicine

HIV-infected men and women can take part in studies of new treatments to fight AIDS

- Services, lab costs and medicines are free.
- *Confidentiality assured.*
- Help can be provided with transportation.
- Child care can be arranged.

Clinic Sites:

St. Louis Regional Medical Center
5535 Delmar Blvd.

St. Louis, Missouri

(314) 879-6412

Clinical Trials Unit

4511 Forest Park Parkway

St. Louis, Missouri

(314) 454-0058

If interested, call

Monday through Friday

9:00 a.m. to 5:00 p.m.

AIDS Information Lines

The Bureau of AIDS Prevention operates an HIV/STD information line that can answer a variety of questions concerning sexually transmitted disease transmission. The toll-free number receives approximately 400 calls per month. Call **(800) 533-2437**, Monday through Friday, 8:00 a.m. to 5:00 p.m.

Below is a listing of other hotline numbers:

AIDS Hotline (National)	(800) 342-2437
AIDS Information Line (Kansas City)	(816) 923-2437
AIDS Information Line (Springfield)	(417) 881-1900
EFA Hotline (St. Louis)	(314) 367-8400
HIV Consultation Service (National)	(800) 933-3413
Herpes Hotline (National)	(919) 361-8488
Physician Consultation Service (Missouri)	(800) 432-0448
STD Hotline (National)	(800) 227-8922
Teens Tap-Teen Info Line (National)	(800) 234-8336

Caring for HIV-Infected Persons: Some Basic Information

Robert H. Hamm, M.D., M.P.H.
Office of Epidemiology

It has been 12 years since the initial report from the Centers for Disease Control and Prevention (CDC) describing the condition that came to be known as the acquired immunodeficiency syndrome (AIDS).¹ Since that time, there has been a continual increase in the understanding of human immunodeficiency virus (HIV) infection and its related diseases and conditions. A number of measures now exist to postpone HIV-induced deterioration of immune system functioning and to prevent or postpone the development of certain opportunistic infections. A recent review has evaluated different preventive measures.² Those reported to have the strongest evidence of efficacy were:

- T-Lymphocyte monitoring
- Antiretroviral therapy in selected patients
- Primary *Pneumocystis carinii* pneumonia prophylaxis
- Secondary *Pneumocystis carinii* pneumonia prophylaxis
- Secondary *Cryptococcus* prophylaxis
- Secondary *Toxoplasma* prophylaxis
- Secondary cytomegalovirus prophylaxis
- Tuberculin testing with chemotherapy for those with positive test results
- Syphilis screening
- Papanicolaou tests
- Educational measures to reduce HIV transmission

However, additional measures, including influenza and pneumococcal vaccinations, prophylaxis for tuberculosis in anergic high-risk individuals and certain additional prophylactic medications, may also be useful.² For example, a Public Health Service Task Force has recommended that HIV-infected persons with a CD4 lymphocyte count <100/μL receive rifabutin for prophylaxis against *Mycobacterium avium* complex disease.³ In addition, itraconazole appears to be effective in preventing relapses of histo-

Table 1. Indicators for Risk of HIV Infection

All Ages:

- Presence of signs/symptoms consistent with HIV-related illness
- Having received blood or clotting factor concentrate between 1978 and 1985
- Being diagnosed with tuberculosis disease
- Being born in a country where most transmission of HIV is thought to occur through heterosexual sexual contact (such countries are found in Sub-Saharan Africa, the Caribbean and parts of Central America and Asia)

Adults and Adolescents:

- For a man, a history of sexual contact with another man
- History of injection drug use
- Having a past or present sex partner who is known or suspected (because of medical signs/symptoms or high risk behavior) to be infected with HIV
- Having sexual contact with multiple partners
- History of exchanging sex for money or drugs
- History of a sexually transmitted disease

Infants and Children

- Having a parent with known HIV infection or any of the above risk factors

Table 2. Essential Elements of HIV Post-Test Counseling⁶

All Patients, Regardless of Test Result:

- Provide test results
- Allow the patient to express feelings and reactions
- Assess patient's understanding of the test results
- Review routes of transmission and risk reduction
- Assess the patient's psychological condition, recommending psychological/psychiatric and support services as needed
- Assess risk behavior and commitment to behavioral change that will reduce risk of HIV transmission

Additional Elements if the Patient's Test is Positive:

- Help patient plan about informing others who may have been exposed to HIV (public health personnel can provide assistance)
- Arrange for medical follow-up as appropriate

plasmosis in patients with AIDS⁴, and has been recommended for secondary prophylaxis of this disease.⁵

In order to maximize the effectiveness of available preventive and treatment measures, it is necessary to identify the HIV-infected individual as early as possible in the course of his or her infection. To this end, physicians and other health care providers should perform risk as-

essment for HIV infection on all patients. HIV-antibody testing (with accompanying pre- and post-test counseling) should be strongly encouraged for any person with a history of sexual or drug use activities (during the period since the late 1970s) that would place him or her at risk of HIV infection. Such testing should also be performed on any individual with signs or symptoms suggestive of infection with HIV. See Table 1.

When a person requests HIV testing and/or is found to be at risk for HIV infection, this presents the clinician with an excellent opportunity to provide education and counseling. Even if an at-risk patient refuses testing, such education and counseling may help prevent transmission of HIV and other infectious agents.

If the patient is found to be HIV-negative, post-test counseling should address the appropriate issues listed in Table 2. It should be remembered that a negative test result may, in some patients, elicit a negative emotional response (such as guilt, or possibly even disappointment). Also, the patient must clearly understand that high-risk behavior will continue to put him or her at risk of infection, and he or she should be helped to make changes in such behavior. In addition, if the patient has recently (within the past three months) been engaging in high-risk activities, he or she could be infected but in the "window period" prior to the development of detectable levels of HIV antibody. If such early infection is a possibility, this should be discussed with the patient and repeat testing done in three to six months.

If the patient is found to be HIV-positive, the following considerations apply:

1. Provide post-test counseling as outlined in Table 2. A patient receiving a positive test result may, for understand-

Table 3. HIV Infection and Tuberculosis

- HIV infection is one of the strongest known risk factors for the progression of latent tuberculous infection to active tuberculosis. In addition, in HIV-infected persons who acquire a new tuberculous infection, clinically active disease can occur very rapidly; intervals as short as 20 days have been described. Rapid development of disseminated disease can occur.^{8,9}
- Clinical presentation of tuberculosis in HIV-infected persons can be atypical. Extrapulmonary disease occurs in 40–75%, often in the presence of pulmonary disease.⁸
- A Mantoux tuberculin skin test (5TU PPD) should be administered to all HIV-infected persons. Tuberculin reactions ≥ 5 mm induration should be considered indicative of tuberculous infection.⁸
- HIV-infected persons with a positive (≥ 5 mm induration) PPD reaction should be evaluated for isoniazid preventive therapy after active tuberculosis (pulmonary or extrapulmonary) has been excluded. The presence of a positive tuberculin skin test in an HIV-infected person is an indication for preventive therapy, regardless of the person's age, unless medically contraindicated. The recommended duration of treatment is a minimum of 12 months.^{8,10}
- Persons with HIV infection should also be evaluated for delayed-type hypersensitivity anergy at the time of PPD testing. Anergic, tuberculin-negative HIV-infected persons, particularly those felt to be at increased risk of tuberculous infection, should be considered for isoniazid preventive therapy after active tuberculosis has been excluded.¹⁰
- All persons diagnosed with active tuberculosis should be offered counseling and HIV-antibody testing.⁸

able reasons, hear very little else that is said at this time. Return appointments will be necessary to ensure that he or she understands the meaning of the results and their implications relative to behavioral change and partner notification. Also, helping the patient make lasting changes in high-risk behavior cannot be accomplished in a single session. Repeated, ongoing sessions of counseling and support will generally be needed.

2. Make arrangements for medical follow-up. A thorough medical history needs to be obtained, along with a physical examination and appropriate laboratory studies. This will provide necessary baseline data, and should also identify any HIV-related illnesses or conditions that may be present. In addition, it will allow the clinician to determine the current stage of the patient's HIV infection.
(continued on page 12)

Figure 1. Stages of HIV Disease⁷

Initial Infection	AIDS Diagnosed				Death
Acute Retroviral Syndrome and Appearance of HIV Antibody	Period of Asymptomatic Infection				
		Early Symptomatic Period	Late Symptomatic Period	Advanced Disease Period	
Typical Duration:	10+ Years	0–5 Years	0–3 Years		1–2+ Years
CD4 Lymphocyte Count:					
1,000		500	200		50

(continued from page 11)

This is important because each stage has different management/treatment needs. One general approach to conceptualizing the stages of HIV disease is shown in Figure 1.

Two important components of the initial evaluation of all HIV-infected individuals are:

- Tuberculin testing accompanied by evaluation for anergy. (Table 3 summarizes the major issues associated with HIV infection and tuberculosis) See related article on page 17 of this issue.
- Assessment of the individual's vaccination status (Table 4 summarizes the vaccines appropriate for use in HIV-infected children and adults).¹¹ Persons with HIV infection should receive annual influenza vaccinations. They should also receive a single dose of pneumococcal polysaccharide vaccine; revaccination with pneumococcal vaccine should be considered six years after the first dose. *Haemophilus influenzae* type b (Hib) conjugate vaccine (HbCV), besides its normal use in children, may be considered for HIV-infected adults.

Several recent articles and publications review the basic components of providing primary care to HIV-infected persons.^{12,13,14} Clinical consultation is available through the HIV Telephone Consultation Service to any physician or other health-care professional providing care to HIV-infected persons. This service is described in detail in the article on page 19 of this issue.

3. Report the patient to the appropriate public health entity. Health care providers in St. Louis City and St. Louis County should report the individual to the St. Louis City Department of Health and Hospitals. Providers in the five-county Kansas City metropolitan area should report to the Kansas City Health Department. All other providers should report to the Bureau of AIDS Prevention at the Missouri Department of Health. Note that all HIV-infected individuals, regardless of whether they meet the case definition for AIDS, are required to be reported according to 19CSR 20-26.030.

Table 4. Recommendations for Routine Vaccination of HIV-infected Persons*

Vaccine/toxoid [†]	HIV Infection	
	Known asymptomatic	Symptomatic
DTP/Td	yes	yes
OPV	no	no
eIPV [§]	yes	yes
MMR	yes	yes [°]
HbCV**	yes	yes
Pneumococcal	yes	yes
Influenza	yes [°]	yes

* Appropriate for human immunodeficiency virus (HIV)-infected children and adults.
[†] The vaccine/toxoid abbreviations are defined as follows: DTP = Diphtheria and tetanus toxoids and pertussis vaccine, adsorbed (pediatric); Td = Tetanus and diphtheria toxoids, adsorbed (for adult use); OPV = Oral poliovirus vaccine; eIPV = Enhanced-potency inactivated poliovirus vaccine; MMR = Measles, mumps, and rubella vaccine; HbCV = *Haemophilus influenzae* type b conjugate vaccine; and Pneumococcal = Pneumococcal polysaccharide vaccine.
[§] For adults ≥18 years of age, use only if indicated.
[°] Should be considered.
 ** May be considered for HIV-infected adults.

4. Be aware of services available to the patient through the department's Bureau of AIDS Prevention, including assistance with partner notification. Information about the bureau's Client Services/Service Coordination Program is presented on pages 6-7 of this issue. One component of Client Services, the Medications Program, is described in an additional article on page 16.

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Bimonthly Morbidity Report, March/April 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Bimonthly Morbidity Summary, March/April 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

What Every Physician Can Do To Help Stop the HIV/AIDS Epidemic

James F. Stanford, M.D.

Kansas City AIDS Research Consortium

A recent report by the Kansas City Health Department contained statistics which should concern all physicians in that metropolitan area. As of April 1, 1993, **2,192** patients with AIDS in the seven-county metropolitan area had been documented through required reporting. It is also estimated that there are an additional 5,000–8,000 cases of HIV infection, indicating we may all see a dramatic increase in the number of HIV-infected patients we treat in the future.

Many physicians may be unaware of the infection that exists in some of their patients. With rare exceptions, those infected patients are also unaware of the virus' presence. After the initial infection, a patient may remain asymptomatic for as long as ten years before the onset of constitutional symptoms and/or opportunistic infections. While some of the population who are unaware of their HIV-antibody status have adopted "safer sex" practices, many others have not, thus unchecked transmission to unprotected sex partners during this period is unfortunately commonplace and fuels the epidemic.

Every physician is in a unique position to help stop the spread of this virus. Naturally, every patient we see with a sexually transmitted disease (STD) should be tested for the HIV antibody. As reasonable as this sounds, I am amazed at the number of instances where a patient with an STD is not offered an HIV test. Last year in one midwestern county **only 11 of 184 patients with an STD were offered testing for HIV!**

While it seems obvious to educate and test those who present with a marker of unsafe sexual behavior (an STD), we must all expand our definition of "high-risk behavior" to include anyone who engages in unprotected intercourse, regardless of sexual preference, race or

other factors. Today in medical schools across the nation our students should be taught to take a sexual history of every patient above the age of ten, and to consider the "risk behavior" rather than the "risk group."

A student in my general medicine clinic recently reported her findings on a heterosexual elderly patient she was seeing for a routine hypertension visit. I asked if she had taken a sexual history and she said, "No, he's 72!"

I persisted, and when she had re-interviewed the patient, she reported that he had experienced unprotected sex within the last 48 hours. That was the perfect opportunity for a professional message on the importance of safer sex. While not HIV infected, the patient was found to have untreated latent syphilis. Almost every sexually active patient we treat is potentially at risk for HIV today, and if we can prevent an infection, we'll slow the epidemic, save lives and avoid millions of dollars in medical expense.

The routine sexual history will serve as an indicator for patients who should be tested, even though they show no outward signs of infection. If the patient's history (or their sexual partner's history) indicates multiple sexual partners, any form of unprotected sex, blood transfusions prior to May 1985, IV drug abuse with needle sharing or other high-risk behavior (anonymous sex, anal intercourse, sex in exchange for drugs, sex under the influence of parenteral and nonparenteral drugs and alcohol or unprotected sex with an individual belonging to a known high prevalence group), an HIV-antibody test should be recommended.

If the patient tests negative, he or she is still a prime prospect for a discussion of the importance of his/her adherence to "safer sex" guidelines to lower the risk of infection. Adolescents especially need to be armed with appropriate and age-

relevant communication skills to help them counter and resist partners who are pressuring them towards unsafe sexual behavior.

If the test is positive, the patient must certainly be educated to prevent transmission to their partners. In addition to the sexual history, there are sentinel signs and laboratory clues that may signal the presence of HIV infection and should prompt testing.

These include unexplained weight loss, fever, sweats, chronic diarrhea and chronic generalized lymphadenopathy; oral thrush or oral hairy leukoplakia; seborrheic dermatitis; dermatomal zoster; recurrent or refractory vaginal moniliasis, pelvic inflammatory disease or bacterial vaginosis; unexplained anemia, leukopenia or thrombocytopenia; eosinophilic folliculitis (itchy red bump syndrome); flat or nodular purplish skin lesions; unexplained neurologic syndromes; the "heterophil-negative" mono-like syndrome, polyclonal hypergammaglobulinemia and PPD positivity. Tuberculosis, both pulmonary and extrapulmonary, should also raise the question of HIV infection.

In addition to preventing the spread of infection, early diagnosis also helps the patient and physician plan a regimen of care to keep the patient healthy as long as possible. By reducing stress, moderating or eliminating alcohol and tobacco consumption, establishing a program of nutrition and exercise and prescribing antiretroviral agents and medications for opportunistic infection prophylaxis, the productive life of the patient can be significantly extended.

The Kansas City AIDS Research Consortium has introduced a program of continuing education designed to give practicing physicians the background they need for early diagnosis and early care of HIV/AIDS patients. For more information, see announcement on page 19 of this issue.

The HIV Medications Program

*Robert Holtkamp
Bureau of AIDS Prevention*

The Medications Program assists eligible HIV-infected persons in the purchase of specific medications for outpatient prophylaxis or treatment of HIV-associated conditions. This is accomplished by providing direct reimbursement to the patient's own pharmacy. Funding for the program comes from Title II of the Ryan White Care Act of 1990.

Eligibility criteria include:

- Proof of HIV infection
- Documented family income at or below 300 percent of federal poverty level
- No outpatient medication coverage by any third party insurance carrier (including Medicaid)

Individuals in licensed health-care facilities or penal institutions are not eligible for the program.

As of June 1, 1993, there are 11 medications being reimbursed through this program for use by infected adults:

Zidovudine (AZT)
Didanosine (ddI)
Zalcitabine (ddC)
Trimethoprim-Sulfamethoxazole
Pentamidine (Aerosolized)
Dapsone
Nystatin
Clotrimazole
Ketoconazole
Fluconazole
Acyclovir

Medication requests for children will be considered on a case-by-case basis.

Given the medications program's limited resources, decisions must be made regarding which drugs can be included for reimbursement. In making these decisions, the Bureau of AIDS Prevention is assisted by a consortium, which includes consumers and health care providers, and also by a physician review panel.

Application for the program is made directly to Bureau of AIDS Prevention, and consists of submitting two forms (Registration and Certification of Financial Eligibility and Medical Eligibility). **These forms can be obtained from the Department of Health, Bureau of AIDS Prevention, P.O. Box 570, Jefferson City, MO. 65102 or by telephoning the bureau at (314) 751-6438.**

Completed applications should be mailed to the same address or faxed to (314) 751-6447.

The **Registration and Certification of Financial Eligibility Form** is completed by the patient. It may need to be accompanied by documentation regarding medical insurance status and income level. The **Medical Eligibility Form** is filled out and signed by the physician. Assistance in the completion of these forms is available from Bureau of AIDS Prevention service coordination personnel also at (314) 751-6438.

Kansas City AIDS Research Consortium Launches Two Programs to Impact Treatment for Area HIV/AIDS Patients

*Gary R. Johnson
Kansas City AIDS Research Consortium*

The Kansas City AIDS Research Consortium (KCARC) has launched two new programs to impact the medical treatment of HIV/AIDS-infected patients in the greater Kansas City area. The programs, a clinical trial of itraconazole in the prophylaxis of histoplasmosis and a physician-education program, are designed to expand the knowledge of HIV treatment and increase access to medical care for HIV-infected patients.

Starting May 1, KCARC sites, in conjunction with the Mycoses Study Group of the National Institute of Allergy & Infectious Diseases, will conduct a clinical

trial utilizing the drug itraconazole for the prevention of histoplasmosis in HIV-infected patients. This study is open to male and female patients who have no life-threatening infection or malignancy other than cutaneous Kaposi's sarcoma and an absolute CD4 count below 150/mm³.

Histoplasmosis is an opportunistic infection that is indigenous to the midwestern region of the United States. Acute infection with histoplasmosis is potentially life-threatening, difficult to treat and may accelerate HIV-associated depletion of the immune system. Consequently, an effective and well-tolerated prevention strategy is vitally important

This study is a result of the 18-month Histoplasmosis Data Base Study conducted by KCARC investigators. The data-base study identified for the first time the risk factors for development of disseminated histoplasmosis in HIV-infected patients. This allowed the principal investigator, David McKinsey, M.D., to design and coauthor the national multicenter prophylaxis study.

The second new program to be conducted by KCARC is an HIV-education program for health care professionals. This program consists of a series of one-on-one "hands on" tutorials designed to increase physician knowledge of risk-behavior assessment and sentinel signs/
(continued on page 17)

TB and HIV Infection Simultaneously in Missouri Patients

Cindy Matheis

Bureau of Tuberculosis Control

The number of reported tuberculosis cases in the United States declined steadily from 1953 to 1984. However, this trend then reversed, and from 1985 until 1991 there was a 18 percent increase in reported cases. Much of this increase was due to tuberculosis occurrence in persons with HIV infection. Of the 114,592 AIDS cases reported nationally from October 1987 through December 1990, 2,910 (2.5%) also had a definitive diagnosis of extrapulmonary tuberculosis. In 1991, there were 657 AIDS cases reported in Missouri; six (2.4%) of these individuals had, in addition, a diagnosis of tuberculosis. During this same time period, nine patients diagnosed with disease due to mycobacteria other than tuberculosis (MOTT) were also reported with AIDS.

The relationship between HIV infection and tuberculosis is explained by the ability of HIV to disrupt the functioning of the host immune response. HIV-induced immune system disturbances, such as macrophage dysfunction and depletion of CD4 cells, directly affect the body's immune response to *Mycobacterium tuberculosis* infection. For example, lymphokines, secreted by CD4 cells, enhance the ability of macrophages to ingest and kill *M. tuberculosis*. In HIV infection, this mechanism is disrupted, and thus the immune system's ability to contain tuberculous infection is limited. As a consequence, the risk of tuberculosis reactivation is markedly increased with HIV infection and, additionally, progression of initial tuberculous infection to disease can occur very rapidly. It is not surprising that pulmonary tuberculosis has recently been added to the expanded AIDS surveillance case definition.

The Advisory Council for the Elimination of Tuberculosis and the Missouri Department of Health are now recommending HIV counseling and testing for all persons with tuberculosis, and for all persons with tuberculous infection who are at increased risk of HIV infection.

Missouri is currently participating in a pilot project that will provide HIV testing in tuberculosis clinics in St. Louis City, St. Louis County and Kansas City. In addition to HIV testing, an anonymous questionnaire survey will be completed by all patients to determine the presence of risk factors for HIV. From this survey, we hope to learn more about how people are becoming infected with HIV. The Centers for Disease Control and Prevention has defined and included in the survey the following behaviors associated with an increased risk for HIV infection:

- Men who have sex with men only
- Men who have sex with men and women
- Injection drug user since 1978
- Person with hemophilia
- Female sex partner of bisexual man
- Sex partner of injecting drug user
- Sex partner of person with HIV/AIDS
- Sex partner of person with hemophilia
- Sex partner of person born in Pattern-II country as defined by the World Health Organization. In Pattern-II countries (areas of central, eastern and southern Africa and some Caribbean countries), HIV is transmitted primarily through heterosexual contact.
- Received blood/blood products between 1978 and 1985
- Received money and/or drugs for sex
- Smoked crack cocaine
- Child of parent at risk for HIV infection

Overall, this project will allow the Bureau of Tuberculosis Control to identify tuberculosis patients, as well as at-risk persons with tuberculous infection, who are co-infected with HIV. It will also help ensure that these individuals receive appropriate therapy and case management. In addition, it will allow the bureau to determine, and then monitor, the epidemiologic trends and clinical

characteristics of individuals who are infected with both *M. tuberculosis* and HIV.

More information on this project can be obtained by contacting Cindy Matheis in the Bureau of Tuberculosis Control at (314) 751-6122.

REFERENCE

Centers for Disease Control and Prevention. TB/HIV Risk Factors Study Protocol, 1992

KCARC

(continued from page 16)

laboratory clues of HIV infection in order to facilitate early diagnosis and intervention and to help provide area physicians with the knowledge, experience and skills necessary to become confident and competent in their ability to manage HIV-infected patients. See announcement on page 19 of this issue.

It is hoped that by providing this tutorial there will be an increase in the number of physicians providing HIV care, and that this will then result in health care becoming more accessible to infected patients. It is also hoped that an increase in the number of physicians routinely taking sexual histories and offering safer sex counseling will help decrease the spread of HIV.

The Kansas City AIDS Research Consortium is a not-for-profit group of 30 area physicians who specialize in the care of HIV-infected patients. These physicians conduct research at one of eight KCARC sites: Truman Medical Center, Kansas University Medical Center, Research Hospital, Menorah Medical Center, Trinity Lutheran Hospital, Baptist Memorial Hospital, St. Luke's Hospital and Southwest Boulevard Family Health Care.

For more information about these programs, contact Gary R. Johnson at (314) 235-5366.

Universal Infant Hepatitis B Immunization

Larry T. Franklin*
Bureau of Immunization

Hepatitis B virus infection is a major cause of acute and chronic hepatitis, cirrhosis, and primary hepatocellular carcinoma.

The reported incidence of acute hepatitis B infection increased 37 percent from 1979–89. An estimated 200,000 to 300,000 new infections occurred annually in the United States during the period 1980–91.

On April 15, 1993, the Missouri Department of Health implemented the Universal Hepatitis B Infant Immunization Program. This program will supply the second and third doses of hepatitis B vaccine to newborns who may have received the first dose in the hospital at birth or administered by a private physician. Those infants who are 12 months of age or less and had not received the first dose of hepatitis B vaccine will be eligible to receive all three doses at a local public health agency.

State-supplied hepatitis B vaccine is also available to initiate the series for newborns in selected hospitals within the Kansas City, St. Louis and Springfield metropolitan areas. This vaccine is limited to infants who are uninsured and non-Medicaid eligible. These infants will be able to complete the three-dose series at the local public health departments.

The previous strategy of only immunizing persons who were at high risk has not proven successful at lowering the incidence of hepatitis B. A comprehensive strategy is necessary to eliminate hepatitis B transmission. This strategy is to include the following:

- Universal vaccination of infants born to HBsAg-negative mothers
- Prevention of perinatal hepatitis B infection
- Vaccination of selected high-risk groups, such as sexually active teenagers, IV drug users and

Table 1. Current ACIP Schedule for Hepatitis B Vaccine

Option #1	Age of Infant
Dose 1	Birth (before hospital discharge)
Dose 2	1–2 months*
Dose 3	6–18 months*
Option #2	
Dose 1	1–2 months*
Dose 2	4 months*
Dose 3	6–18 months*

*Hepatitis B vaccine can be administered simultaneously with diphtheria-tetanus-pertussis (DTP), Haemophilus influenza type b conjugate (Hib), measles-mumps-rubella (MMR) and oral polio (OPV) vaccines.

sexually active homosexual and bisexual men.

Newborns have been targeted for vaccination for the following reasons:

- A system for vaccine delivery in early childhood already exists.
- Infant doses of hepatitis B vaccine cost less than adult doses.
- One-fourth of all chronic hepatitis B carriers are infected during birth or in the first five years of life. The probability of becoming a carrier is highest with infection acquired at birth (>90 percent) or in the first five years of life (>70 percent) and gradually declines to 6–10 percent for persons infected as adults.

The Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices and the American Academy of Pediatrics recommend that

all infants, except those born to HBsAg-positive mothers, receive a series of three intramuscular doses (0.25 ml) of hepatitis B vaccine. The three-dose series is recommended to be administered using either of the two schedules described in Table 1.

The current recommendation for universal infant vaccination neither precludes vaccinating adults identified to be at high risk of infection nor alters previous recommendations for post-exposure prophylaxis for hepatitis B. However, in the long term, universal infant vaccination should substantially decrease the need for vaccinating adults and adolescents at high risk.

**Larry T. Franklin has moved to a new federal assignment in Delaware. For more information, contact Mary Ann Harder at (314) 751-6133.*



Showcasing Child Health in Missouri

October 4, 1993

Holiday Inn Executive Center
Columbia, Missouri

This conference is hosted by the Missouri Department of Health and the Children's Services Commission. It will explore current child health needs and concerns in Missouri, highlight innovative approaches in providing child health services and feature intriguing research efforts. A major emphasis is access to care. For more information call (314) 751-6172.

HIV Telephone Consultation Service Available Nationally

Reprinted from a letter received from G. Stephen Bowen, M.D., Associate Administrator for AIDS, Health Resources Services Administration

I would like to inform you about an exciting new national toll-free phone line that will provide clinical consultation for health care professionals who treat people with AIDS/HIV. Professionals staffing the toll-free consultation line will start accepting calls March 1 from health care workers anywhere in the continental United States. Hours of operation are 7:30 a.m. to 5:00 p.m. (west coast time), Monday through Friday. At all other times, including weekends, callers can leave voice mail messages. The number is 1-800-933-3413 and there is no charge for the service.

Physically located at San Francisco General Hospital, the National HIV Telephone Consultation Service is staffed by faculty physicians from the University of California, San Francisco Department of Family and Community Medicine, as well as nurse practitioners and clinical

pharmacists. They provide case consultation to health care professionals who have questions about HIV care for children and adults that may include HIV/AIDS drug information, clinical trials information and subspecialty issues and case referral. Health care professionals can ask a question on any topic pertaining to HIV care. Callers will be asked to provide patient-specific information, including CD4 cell count, current medications, sex, age and the patient's HIV history as well as information about where they are located and what type of practice they have.

This new national service is based on 16 months local experience of the HRSA-funded Community Provider AIDS Training (CPAT) project. The project supported in part by the Western AIDS Education and Training Center (ETC), formed a telephone based consultation line that served northern California HIV care providers. Ron Goldschmidt, M.D., Director of San Francisco General's Family Practice Inpatient Service, is the

CPAT project director and has played a key role in expanding the consultation line to a national service. CPAT data shows that more than 70 percent of provider calls are answered immediately or within one hour; 96 percent are answered within 24 hours. Please be patient if response takes longer initially.

I encourage you to make the HIV Telephone Consultation Service number widely known among health care providers in your areas. The financial support for this service is provided through the United States Public Health Service. Our commitment to this project is for the long term.

Again, please remember and recommend the national HIV Telephone Consultation Service - 1-800-933-3413. The goal of this project is to assist those providers already caring for people with HIV or AIDS and to involve more primary health care providers in HIV care delivery by providing a reliable, easily accessible clinical consultation.

The Kansas City AIDS Research Consortium

Presents

HIV CARE: A Hands-On Tutorial For The Health Care Professional

The program consists of a series of half-day or full-day experiences with physicians as they treat HIV patients in their practice. It is an interactive, one-on-one mini-sabbatical designed to teach clinically relevant information no didactic-only seminar can provide.

Each physician who enrolls in the program is given the opportunity to select the care-provider setting and level of care learning that best fits his/her needs. The preceptors of the program are the investigators who participate in HIV/AIDS research at the Kansas City AIDS Research Consortium, and who are also primary care givers to the majority of the HIV-infected patients in the greater Kansas City area.

For a brochure describing the individual hands-on learning experiences available, please contact the Kansas City AIDS Research Consortium office at (314) 235-5366.

The First Decade of AIDS in Missouri

Robert Hamm, M.D., M.P.H.
Office of Epidemiology

Kevin Gipson
Bureau of AIDS Prevention

In 1982, the first Missouri AIDS case was reported to the Department of Health. Over the next decade, through the end of 1992, over 4,200 cases of the disease were diagnosed in residents of the state. This article, which is divided into two parts, will summarize the epidemiology of AIDS in Missouri during this period. The first part will compare the characteristics of Missouri AIDS cases with those of cases observed nationwide. This will be done using data on cases reported through the end of 1992 (which totaled 3,214 in Missouri and 253,448 nationwide), the latest period for which U.S. data is currently available.¹ The second part of this article will examine more closely the epidemiology of AIDS within Missouri. This section will utilize newer data (through April 1993) containing reports of 4,204 AIDS cases which were diagnosed during the period from 1982–92.

Comparison of the Epidemiology of AIDS in the United States and Missouri

Nationally, over the past decade, there has been a continuing increase in the number of annually diagnosed cases. However, in the latter part of this period the rate of increase slowed considerably, and seems to show signs of plateauing. See Figure 1. For Missouri, in contrast, the annual number of diagnosed cases has continued to rise throughout the period without any noticeable slowing. See Figure 2.

Of the 253,448 AIDS cases reported nationally through the end of 1992, 171,890 (67.8%) have died. In Missouri, of the 3,214 cases reported over the same period, 1,937 (60.3%) have died.

Missouri's AIDS case rate is 13.6 per 100,000 population for cases reported

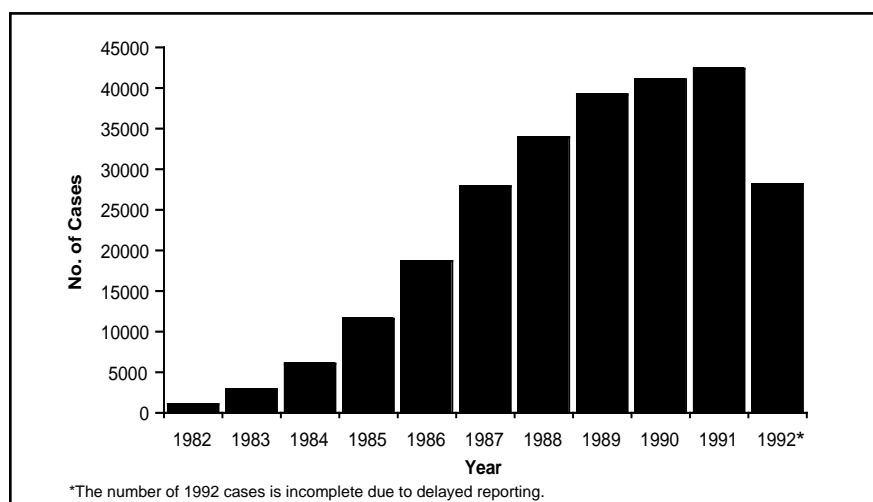


Figure 1. AIDS cases by year of diagnosis, United States, 1982–92.

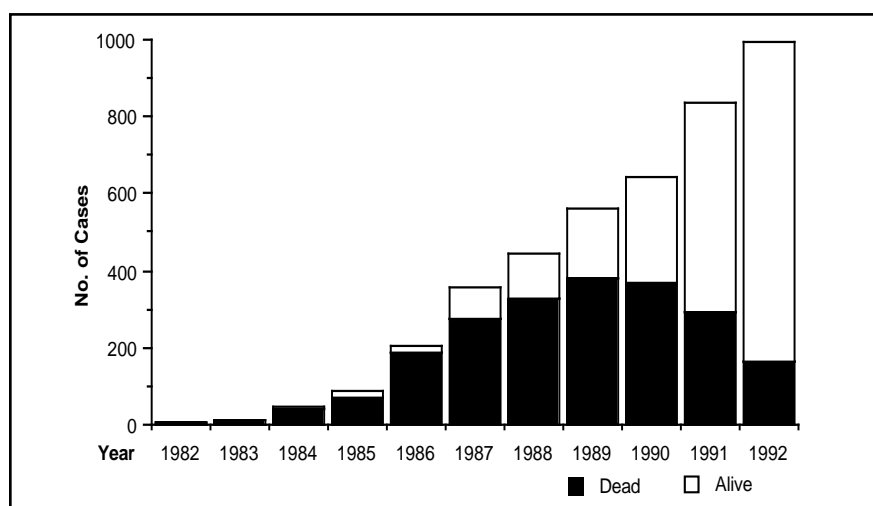


Figure 2. AIDS cases and deaths by year of diagnosis, Missouri, 1982–92.

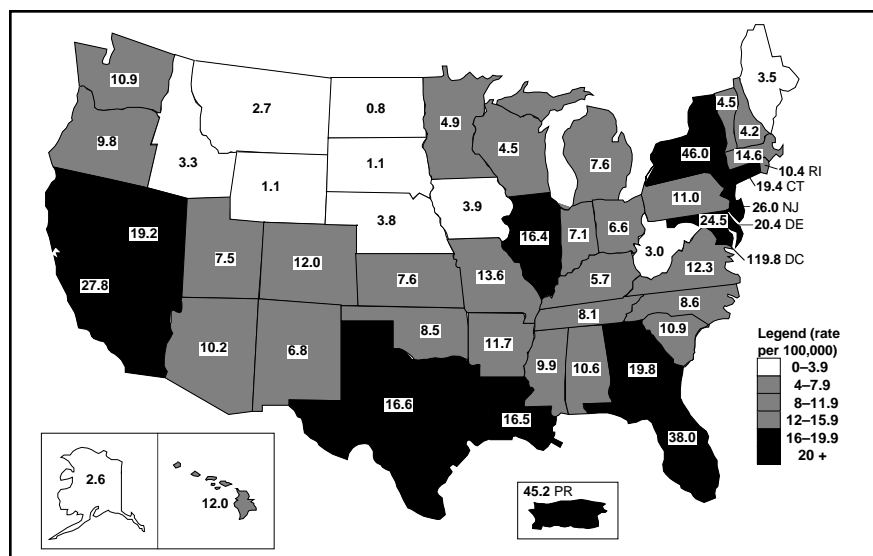


Figure 3. AIDS case rates per 100,000 population, reported through 1992.

during 1992; the overall U.S. rate is 17.8 per 100,000. Missouri's 1992 annual rate ranks 14th among the 50 states (where the range is from 46.0 per 100,000 in New York to 0.8 per 100,000 in North Dakota). See Figure 3. Since 1989, Missouri's relative position among the states has increased from 21st to its current level of 14th.

Missouri has a higher AIDS case rate than any surrounding state with the exception of Illinois. A major reason is the presence of two large metropolitan areas in Missouri, both of which contribute substantial numbers of cases to the state's total. Note that of the surrounding states, none has a truly large metropolitan area with the exception of Illinois, which includes Chicago.

Of Missouri AIDS cases reported through 1992, 74.3 percent were in homosexual or bisexual men who did not report injecting drug use, 7.0 percent were in homosexual or bisexual men who also reported injecting drug use and 7.7 percent were in injecting drug users. This contrasts with reported cases nationally, where homosexual/bisexual men with no history of injecting drugs comprised 56.3 percent, homosexual/bisexual men who reported using injecting drugs comprised 6.3 percent and injecting drug users made up 22.7 percent of all cases. See Table 1.

Another difference is the lower percentage of heterosexual cases in Missouri (3.5%) compared to the United States as a whole (6.4%). This may, in part, be attributed to more comprehensive and aggressive follow-up of reported cases in Missouri compared to the situation nationwide. Specifically, a number of AIDS patients will initially only report heterosexual activity as a possible source of infection. However, with further investigation, other risk factors become apparent, and these cases are then appropriately classified on the basis of these additional findings.

White males made up a much higher percentage of reported AIDS cases in Missouri compared to nationally re-

Table 1. AIDS Cases by Exposure Category, Missouri and United States, Reported Through 1992

Exposure Category	Missouri		United States	
	Cases	%	Cases	%
Homosexual/Bisexual	2,387	74.3	142,626	56.3
Homosexual/Bisexual/IDU	224	7.0	15,899	6.3
Injecting Drug Use	248	7.7	57,412	22.7
Heterosexual	111	3.5	16,254	6.4
Hemophilia	90	2.8	2,214	0.9
Blood Transfusion	83	2.6	5,286	2.1
Perinatal	19	0.6	3,665	1.4
Other, Undetermined or Under Investigation	52	1.6	10,092	4.0
Total	3,214	100.0	253,448	100.0

Table 2. AIDS Cases by Race/Sex, Missouri and United States, Reported Through 1992

Race/Sex	Missouri*		United States**	
	Cases	%	Cases	%
White Male	2,306	71.7	125,346	49.5
Black Male	643	20.0	60,302	23.8
White Female	105	3.3	7,279	2.9
Hispanic Male	81	2.5	35,974	14.2
Black Female	63	2.0	15,695	6.2
Other Male	12	0.4	1,844	0.7
Hispanic Female	1	0.0	6,225	2.5
Other Female	1	0.0	214	0.1
Unknown	2	0.1	569	0.2
Total	3,214	100.0	253,448	100.0
*Racial/ethnic composition of Missouri:				
	White	88%	Black	11%
	Hispanic	1%	Other	<1%
**Racial/ethnic composition of United States:				
	White	76%	Black	12%
	Hispanic	8%	Other	4%

ported cases (71.8% vs. 49.5%), although it must be noted that 88 percent of the population of Missouri is white compared to 76 percent nationally. White females, both in Missouri and nationwide, comprised approximately 3 percent of the cases. See Table 2.

Black males in Missouri comprised 20.0 percent of reported AIDS cases compared to 23.8 percent nationwide. Black females in the state comprised 2.0 percent of the cases; nationwide they represented 6.2 percent. The percentage of the Missouri population that is black (11%) is comparable to the percentage

of blacks within the U.S. population (12%). Numbers and percentages of Hispanic cases in Missouri were small, reflecting the relatively small numbers of Hispanics in the state.

The percentage of cases found in each age group was generally similar for Missouri cases compared to cases reported nationwide. The major exception to this was that 25 percent of Missouri cases were reported in 20–29 year olds, whereas the percentage of cases in this age group for the United States was 19 percent. This is of interest since many of

(continued on page 22)

Table 3. AIDS Cases by Age Group, Missouri and United States, Reported Through 1992

Age Group	Missouri		United States	
	Cases	%	Cases	%
<13	29	0.9	4,249	1.7
13–19	29	0.9	946	0.4
20–29	801	24.9	48,295	19.1
30–39	1,425	44.3	115,918	45.7
40–49	636	19.8	57,987	22.9
>49	294	9.1	26,053	10.3
Total	3,214	100.0	253,448	100.0

(continued from page 21)

the persons diagnosed with AIDS in their 20s were likely infected with HIV while teenagers. See Table 3.

The Epidemiology of AIDS in Missouri

Through the end of 1992, AIDS cases had been reported in residents of 89 of Missouri's 114 counties. Of those 25 counties that had no reported cases in their residents, all were adjacent to at least one other county that had two or more cases among its residents. See Figure 4.

The annual number of diagnosed AIDS cases is continuing to increase for each of Missouri's three major racial/ethnic groups. Whites, who make up approximately 88 percent of Missouri's population, contribute the most cases, followed by blacks (about 11 percent of the population) and Hispanics (about 1 percent of the population). In addition, 11 cases have been reported in Asians and six cases in Native Americans. The race/ethnicity of two individuals is unknown. See Figure 5.

When one examines AIDS case rates per 100,000 population rather than total numbers of cases, the marked over-representation of blacks and Hispanics in the epidemic becomes readily apparent. As the epidemic has progressed, the divergence of the rates of black and Hispanic cases from those of whites has become increasingly pronounced. See Figure 6.

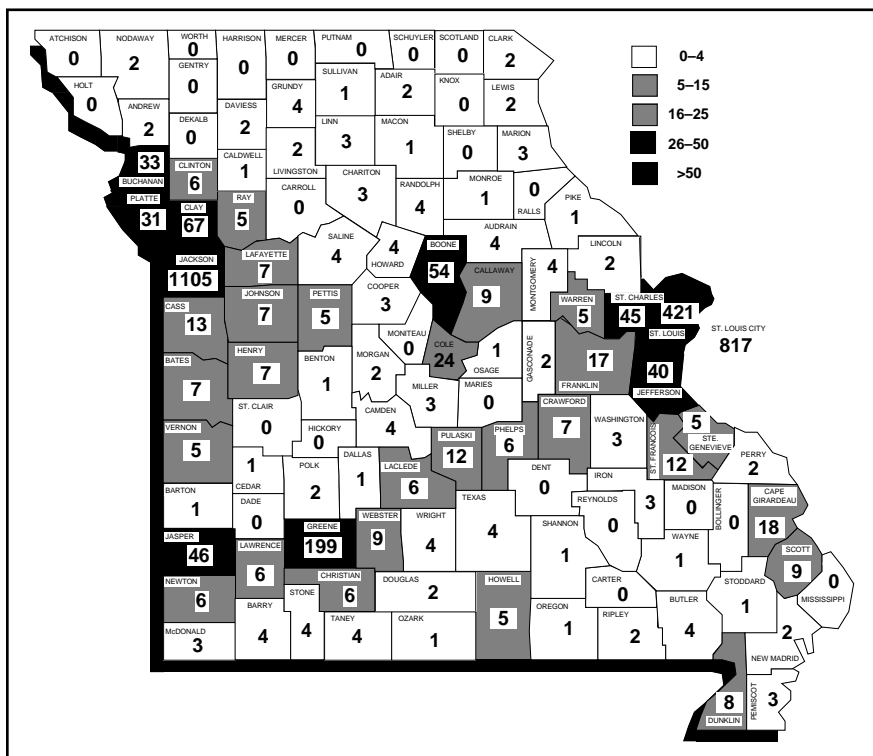


Figure 4. Cumulative AIDS cases by county of residence, Missouri, reported through 1992.

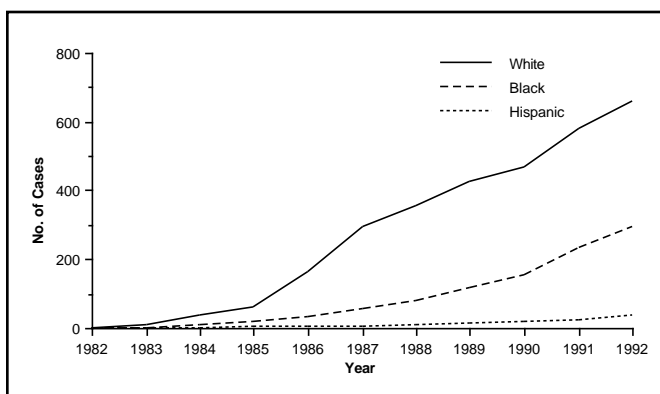


Figure 5. AIDS cases by race and year of diagnosis, Missouri, 1982–92

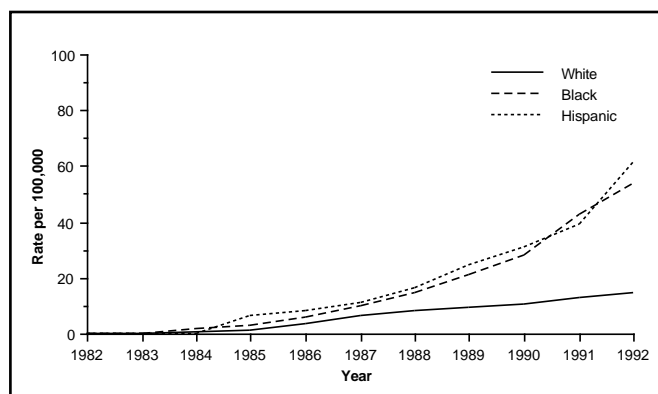


Figure 6. AIDS rates by race and year of diagnosis, Missouri, 1982–92

Figures 7 and 8 demonstrate the increasing annual incidence of AIDS cases that has been seen in both males and females from the different racial/ethnic groups.

For males in all three of the racial/ethnic groups, homosexual activity is the most common route of transmission. For black and Hispanic men, injecting drug use is a much more frequently occurring risk behavior than in white men. For both white and black females, transmission through heterosexual contact accounts for approximately half of the cases reported. For black females, as with black

males, injecting drug use is a more prevalent means of transmission than in the white cases. Among pediatric cases, all cases in blacks are attributed to transmission from an infected mother, whereas in white children, the majority of cases are related to transfusion of infectious blood/blood products. See Table 4.

The annual incidence of AIDS cases is increasing among both white and black men whose risk behavior was having sex with another man. The rate of increase is similar for the two races. This

continuing increase in incidence is in contrast to what has been seen nationwide, where the rise in the number of cases among homosexual and bisexual men began declining by 1987.² See Figure 9.

After showing an increase in yearly incidence during the first part of the preceding decade, the annual number of cases occurring in men who had sex with other men and used injecting drugs has subsequently plateaued. See Figure 10.

(continued on page 24)

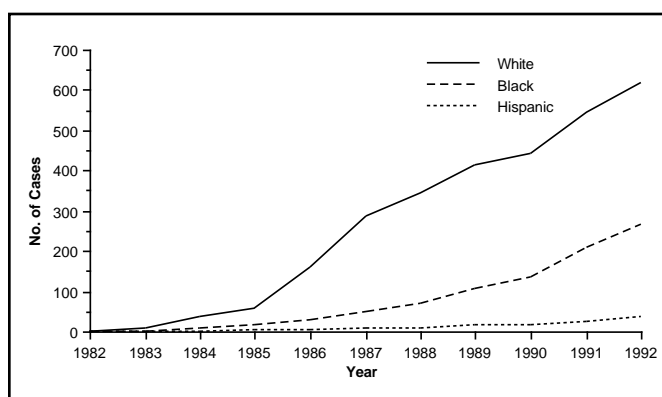


Figure 7. AIDS cases in males by race and year of diagnosis, Missouri, 1982–92

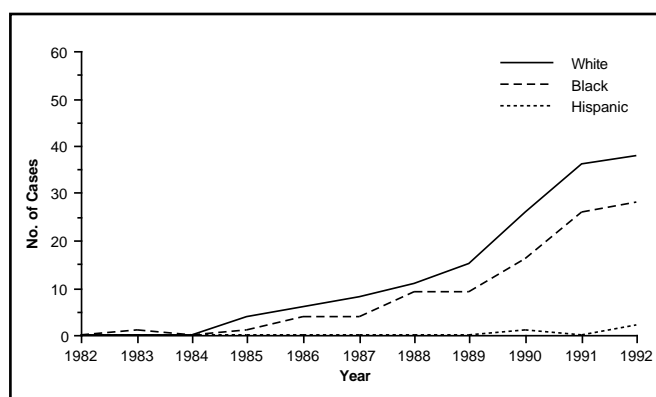


Figure 8. AIDS cases in females by race and year of diagnosis, Missouri, 1982–92

Table 4. AIDS Cases by Race, Sex and Risk Category, Missouri, 1982–92												
Exposure Category	White				Black				Hispanic			
	Male		Female		Male		Female		Male		Female	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Adult/Adolescent												
Men who have sex with men	2,382	81.8	0	0.0	617	69.5	0	0.0	66	55.0	0	0.0
Men who have sex with men and inject drugs	222	7.6	0	0.0	65	7.3	0	0.0	6	5.0	0	0.0
Injecting drug use	97	3.3	32	22.7	136	15.3	33	36.3	34	28.3	1	33.3
Heterosexual contact	30	1.0	67	47.5	26	2.9	46	50.5	3	2.5	1	33.3
Hemophilia/coagulation disorder	101	3.5	1	0.7	10	1.1	0	0.0	0	0.0	0	0.0
Recipient of blood transfusion or tissue	44	1.5	29	20.6	11	1.2	8	8.8	2	1.7	0	0.0
Undetermined	37	1.3	12	8.5	23	2.6	4	4.4	9	7.5	1	33.3
Total Adult/Adolescent Cases	2,913	100.0	141	100.0	888	100.0	91	100.0	120	100.0	3	100.0
Pediatric (>13 years)												
Mother with/at risk for HIV infection	4	36.4	3	75.0	6	100.0	8	100.0	0	0.0	0	0.0
Hemophilia/coagulation disorder	4	36.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Recipient of blood transfusion or tissue	3	27.3	1	25.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Pediatric Cases	11	100.0	4	100.0	6	100.0	8	100.0	0	100.0	0	100.0
Total Cases	2,924		145		894		99		120		3	

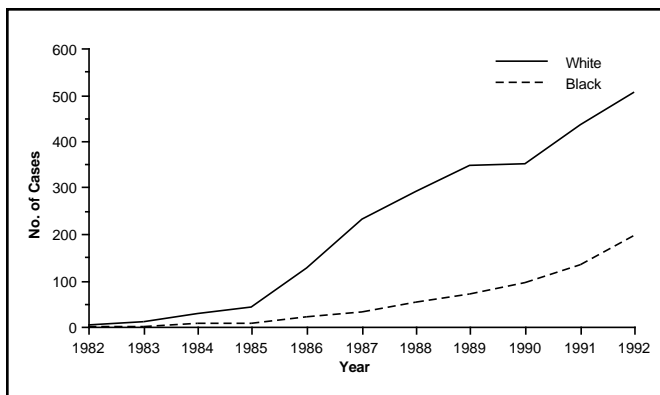


Figure 9. AIDS cases in men who have sex with men by race and year of diagnosis, Missouri, 1982–92

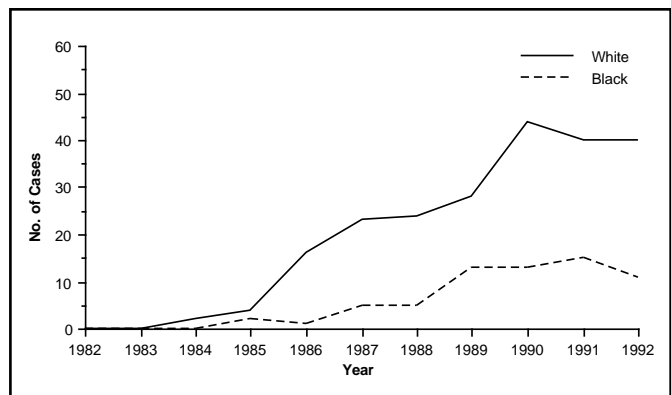


Figure 10. AIDS cases in men who have sex with men and inject drugs by race and year of diagnosis, Missouri, 1982–92

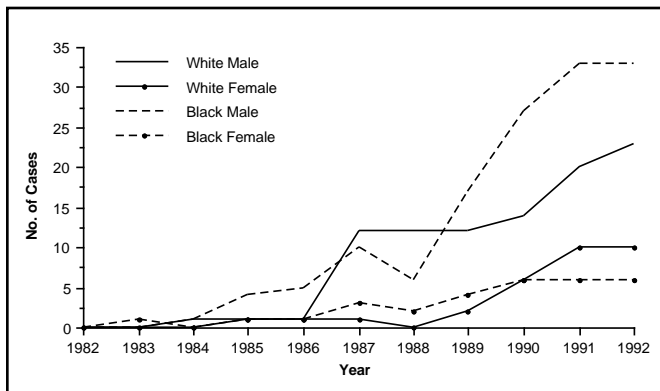


Figure 11. AIDS cases in injecting drug users by race, sex and year of diagnosis, Missouri, 1982–92

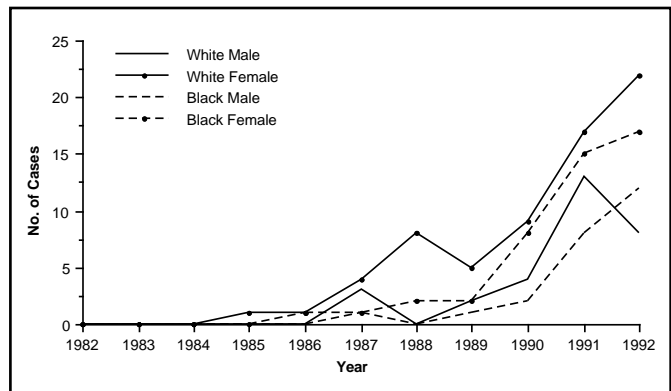


Figure 12. AIDS cases in heterosexual contacts by race, sex and year of diagnosis, Missouri, 1982–92

The annual incidence of AIDS cases in injecting drug users did not show appreciable increases until the mid- to late-1980s. Overall, numbers of cases have remained relatively low, especially among females. During the past one to two years, the yearly incidence has plateaued in blacks and in white females, although black males continue to show the largest number of new cases. In white males, the annual incidence continues to rise. See Figure 11.

Since the late 1980s, the annual incidence of AIDS cases attributed to heterosexual contact has been increasing for all groups, except for a decrease from 1991–92 among white males. See Figure 12.

Figure 13 shows AIDS cases by exposure category in each of four separate geographic areas in Missouri. In each of the areas, a male having sex with another male is the risk activity that accounts for the largest number of cases.

In each area except Springfield/Greene County, cases attributable to this activity greatly outnumber the sum of the cases attributable to injecting drug use and heterosexual contact. In Springfield/Greene County, a large percentage of the cases associated with injecting drug use are in inmates at the Medical Center for Federal Prisoners.

Comment

When examining AIDS data, it must be kept in mind that at the time a diagnosis of AIDS is made, the patient has likely been infected with HIV for at least several years. Consequently, the epidemi-

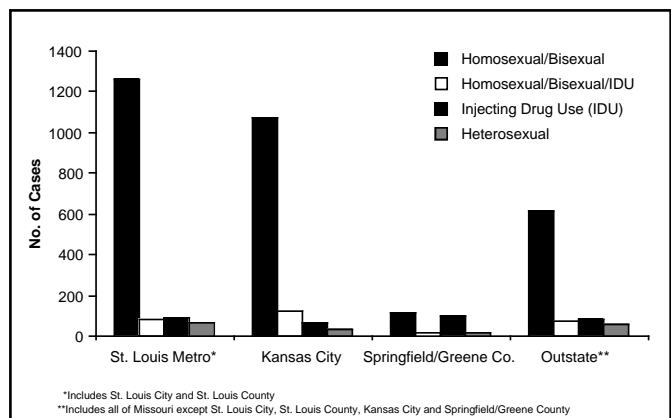
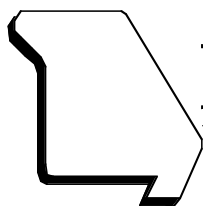


Figure 13. AIDS cases by exposure category and area of residence, Missouri, 1982–92

ology of AIDS cases may not reflect the current epidemiology of new HIV infections.

Sexual contact between men is the primary route by which Missouri AIDS cases have acquired their infection. In contrast to what is occurring for the nation as a whole, the annual incidence
(continued on page 27)



HIV/AIDS Statistics

June 1993

Missouri Department of Health
Bureau of AIDS Prevention

Total AIDS Cases to Date

U.S. AIDS case reports 289,320
U.S. AIDS deaths reported182,275 67.8%

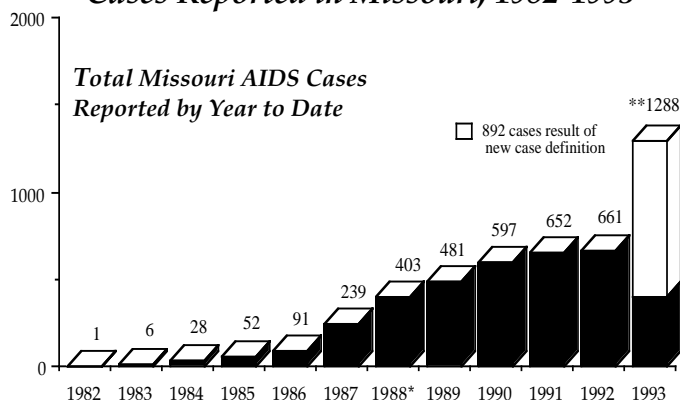
Missouri AIDS case reports 4,499
Missouri AIDS deaths reported 2,230 50.1%

Cases reported in Missouri
with official residence elsewhere 563

Total Diagnostic Tests Performed by State Laboratory

	# of Tests	# Positive	Percent Positive
1986	2,620	306	11.6%
1987	14,508	441	3.0%
1988	39,203	698	1.8%
1989	57,458	872	1.5%
1990	66,853	1,021	1.5%
1991	78,256	1,024	1.3%
1992	91,024	1,129	1.2%
1993	21,396	264	1.2%

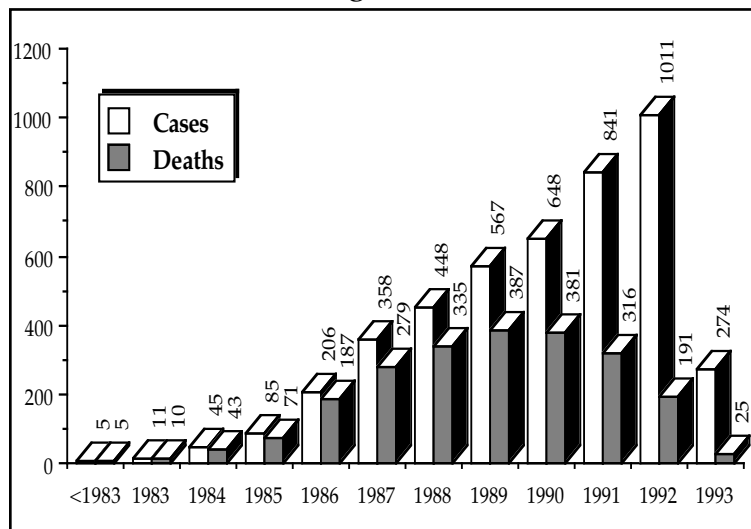
Cases Reported in Missouri, 1982-1993



*One 1988 case diagnosed in 1969

**The AIDS case definition was changed on January 1, 1993. This change broadened the definition to include individuals with HIV infection who have a CD4 count of <200 and added to the AIDS defining conditions, recurrent bacterial pneumonia, pulmonary tuberculosis and invasive cervical cancer.

Case Reports and Deaths by Year of Diagnosis



Cumulative AIDS Cases and Deaths Reported 1982-1993

	Cases	Deaths
St. Louis City	1,149	586
St. Louis County	601	329
Kansas City Area	1,695	783
Springfield/Greene Co.	146	79
Fed. Prison Med. Center	139	63
Outstate Missouri	769	390
Missouri Total	4,499	2,230

HIV in Women

Janet Voorhees, R.N.
Washington University School
of Medicine

As of December 31, 1992, approximately 12 percent (29,477/253,448) of the AIDS cases reported in the United States were in women. Women represent the fastest-growing segment of the population to be HIV infected. In 1981, women accounted for only three percent of all reported AIDS cases in the United States, but by 1993, more than 13 percent of the cases reported occurred in women. Worldwide, women account for about a third of all adults infected with HIV. In the next decade, the trend of increasing numbers of women with HIV is expected to continue until their numbers begin to rival those of men.

AIDS has been the leading cause of death for women aged 15–44 in New York since 1986. In the United States, AIDS is currently the leading cause of death in young black women and the fifth leading cause of death of women of reproductive age. Nationally, women of color make up about 75 percent of the AIDS cases in women, about 53 percent of whom are black women. One fourth of the reported cases of AIDS in women have been among those 20–30 years old. Many women are infected while still in their teens.

Transmission

Half of the women with AIDS reported in the United States acquired HIV through intravenous drug use. Heterosexual contact was the mode of transmission for 36 percent of the cases, of whom almost one third did not know their contacts were at risk for HIV infection. Recipients of blood products or tissue constitute seven percent of the women with AIDS and another seven percent of the female adult cases of AIDS are listed as “other/undetermined.” Cross-sectional studies of couples consisting of one HIV-infected partner show male to female transmission rates of 15–

20 percent, but show female to male transmission rates ranging from zero to only half that of the male to female rate. Consequently, women appear to be at a substantially greater risk of heterosexual acquisition of HIV infection than men.

Pregnancy and HIV

Nearly 80 percent of the women with AIDS are in their reproductive years. Not surprisingly, more than 86 percent of all pediatric AIDS cases have been in children whose mothers had HIV infection or were known to be at risk for HIV infection. To date, studies have not shown that pregnancy accelerates the progressive course of HIV infection. Slightly lower birth weights have been observed in infants born to HIV-infected mothers. The reported rate of perinatal transmission varies, ranging from 20–40 percent. All infants born to seropositive mothers passively carry HIV antibody up to 15 months after delivery.

Newer HIV-testing techniques, such as polymerase chain reaction (PCR), allow for earlier identification of HIV infection in infants. Now the infection status of most children can be determined by the time they are six months old and occasionally as early as the day of birth. Some evidence indicates as much as 50 percent of perinatal transmission may actually be through intrapartum transmission. Half of the infants do not have HIV detectable at birth but within a few months have a viremia pattern resembling documented “acute HIV infection.” It has also been reported that HIV infection is more common in the first-born of twins. Breast milk is an unusual but recognized source of HIV transmission to the infant. In the United States, it is recommended that HIV-positive women should not breast-feed.

Women With AIDS in Missouri

In Missouri, females accounted for just over five percent (170/3,214) of the cumulative reported cases of AIDS at the end of 1992; but this figure is expected

to climb. Women now account for greater than nine percent of the HIV infection cases reported in the state. Black females account for about 38 percent of the cases of AIDS reported in Missouri women and 53 percent of the currently reported cases of HIV infection in women in Missouri.

Clinical Manifestations of HIV-Infected Women

Little is known of the natural history of HIV infection in women or of standards for clinical care of HIV-infected women. In response to increasing awareness of the needs of women with HIV infection, the National Institutes of Health (NIH) sponsored a two-day conference on women and HIV infection in December 1990. This conference was attended by men and women with HIV, activists, health-care workers, researchers and government administrators. Gender-specific differences in the natural history of HIV in women were reported.

Women with HIV and low CD4 counts have been reported to develop cervical cancer, pelvic inflammatory disease and bacterial pneumonia in higher proportion compared to uninfected women. These diseases were not included in the 1987 Centers for Disease Control definition of AIDS, but have since been encompassed in their 1993 Revised Classification System for HIV Infection and Expanded Surveillance Case Definition for AIDS Among Adolescents and Adults. There are reports of recurrent vaginal candidiasis being an early symptom in HIV-infected women. Vaginal candidiasis that is refractory to treatment is being seen with more advanced disease. One small study showed an increase in esophageal candidiasis in women and another showed an increased incidence of *Mycobacterium avium* complex infection. Sample sizes of the studies were too small for any statistical significance. These statistical deficiencies have generated increased efforts in enrolling women in AIDS clinical trials.

Research in HIV-Infected Women

As a result of the 1990 conference, the Division of AIDS of NIH created the Women's Health Committee to address the growing needs of women-specific issues in AIDS clinical trials. In 1990, only seven percent of all participants in adult AIDS clinical trials were female. By the end of 1992, women constituted 24 percent of all adults in the trials. In the past year, 443 women and 2,043 men were enrolled in a large scale study of individual versus combination antiretroviral therapy. This is the first nationwide study with a large scale substudy gathering gynecologic data in women and should provide useful information on the efficacy of antiviral drugs. This study will further delineate the natural history of HIV infection in women.

The AIDS Clinical Trials Unit (ACTU) at Washington University School of Medicine in St. Louis has been enrolling female patients in research trials since the beginning of 1988. Women have historically been slow to receive health care and tend to put the needs of family and children before their own. In an effort to recruit more women into research, the ACTU has opened a research unit at St. Louis Regional Hospital, as well as providing assistance with child care and transportation.

Care of Women With HIV Infection

Although much is still to be learned about women with HIV infection, we do know that many of these women do not get an HIV test because they do not perceive themselves to be at risk. Health-care providers also do not commonly perceive women to be at risk and are less likely to ask women than men about risk behaviors. Health-care workers should, therefore, encourage testing in those who have had multiple sex partners or have used IV drugs. A history of sexually transmitted diseases or recurrent vaginal yeast infections should alert the health care worker to the possibility of HIV infection. Women with HIV should have PAP smears at least annually and prefer-

ably every six months. Abnormal PAP smears should be followed by colposcopy or biopsy. Systemic antifungal prophylaxis may be necessary to control recurrent vaginal yeast infections and repeated long-term use of nonprescription products should be discouraged without periodic follow-up by a physician. When prescribing antiretroviral and antimicrobial therapy for women, possible reduced effects of oral contraceptives should be kept in mind and women should be appropriately counseled. In the meantime, it is important to continue efforts to educate the general population on the spread of HIV infection and what protective measures should be used.

The Washington University AIDS Clinical Trials Unit may be reached at (314) 454-0058.

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Decade of AIDS in Missouri

(continued from page 24)

of Missouri cases associated with this risk behavior is continuing to rise at a very noticeable rate. This would seem to indicate that the change to lower-risk sexual activities among gay men, which has been observed in certain other parts of the country, has been slower to come about in Missouri.

Numbers of cases attributable to injecting drug use and heterosexual contact remain relatively low. However, the overall trends over the past few years, especially in the heterosexual contact group, have generally been upward (similar to what is being seen nationwide²). If

these trends continue, it is obvious that these routes of transmission will, in time, come to contribute significant numbers of new AIDS cases. In addition, such trends would be expected to mean that an increasing proportion of cases will be in women, and that blacks and Hispanics will come to be even more disproportionately represented among Missouri AIDS cases.

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Upcoming Conference

THE BASICS OF INFECTION CONTROL 3RD ANNUAL CONFERENCE

September 8–10, 1993
Capitol Plaza Hotel, Jefferson City, MO

Purpose

This three-day conference will begin to prepare healthcare professionals as facilitators and resource persons in prevention and control of common nosocomial infections. It will also help the professional develop skills in managing the everyday responsibilities of infection surveillance, analysis of disease data, and resolving infection control problems in a facility.

Contact Hours

Applications have been approved for 22 RN/LPN contact hours, 2.1 PACE credit for medical technologists/microbiologists and 20.25 CME's for physicians.

Sponsors

Co-sponsored by the Missouri Department of Health and eight other organizations.

You Should Attend If You Are A:

- Nurse (RN, LPN) or medical technologist/technician responsible for infection control in an acute care hospital, long term care facility (nursing home, mental health, developmental disabilities, rehabilitation), or home health agency.
- Physician responsible as medical director or consultant to an infection control program.
- Health facility consultant responsible for surveys, investigations, and licensing.
- Community health professional responsible for assisting with facility outbreaks and infectious disease follow-up in the community.

Registration

For complete agenda and registration form, call (314) 751-6115.

Bureau of Communicable Disease Control 1992 Annual Report

Michael Fobbs, B.A.

Mahree Fuller Skala, M.A.

Bureau of Communicable Disease Control

Enteric Diseases

The biggest change in enteric diseases in 1992 was the increase in incidence of shigellosis in the Eastern district. Shigellosis increased by 520 percent, from 83 cases in 1991 to 515 cases in 1992. The Eastern district was concurrently suffering a major hepatitis A outbreak. See Figure 1. The two diseases can often be reflective of underlying economic and social problems such as overcrowding and poor sanitation.

The overall increase of shigellosis in the state for 1992 was 186.5 percent, from 259 cases in 1991 to 742 in 1992. The number of cases is 80.5 percent higher than the five-year median of 411 cases calculated using the annual totals from

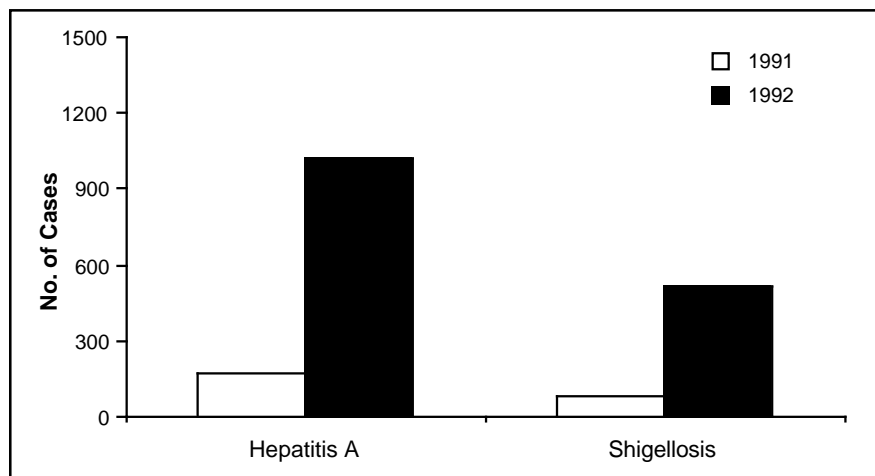


Figure 1. Cases of hepatitis A and shigellosis in the Eastern District, Missouri, 1991 and 1992.

1987 to 1991. See Figure 2. Shigellosis increased in all districts except the North-eastern. The largest increases occurred in the Eastern, Southeastern and Central districts.

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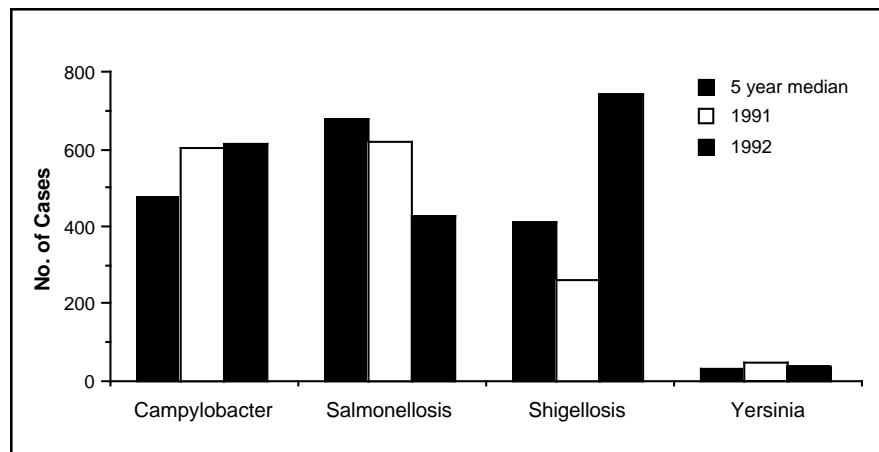


Figure 2. Enteric disease reports, Missouri, five-year median, 1991 and 1992.

Inside this Issue...

Page	
4	1992 Communicable Disease and Nosocomial Outbreaks
6	Bureau of AIDS Prevention - 1992 Report
10	Tick-Borne Disease Summary - 1992
17	Vaccine-Preventable Diseases - 1992
18	Tuberculosis in 1992
23	Elevated Nitrate Levels in Missouri's Private Wells
24	Syphilis Outbreak in St. Louis Metropolitan Area
26	Sexually Transmitted Diseases - 1992

(continued from page 1)

Campylobacter cases increased by 2.0 percent overall, from 602 cases in 1991 to 614 in 1992. The 1992 total was 29.8 percent higher than the five-year median of 473 cases. See Figure 2. Increases were seen in the Eastern, North-western and Southwestern districts. Decreases were seen in the Central and Southeastern districts with no change in the Northeastern district.

Salmonellosis decreased in all districts in 1992. The number of cases fell 30.8 percent, from 616 cases in 1991 to 426 in 1992. This was 36.9 percent below the five-year median of 676 cases. No major outbreaks of salmonella were reported in 1992. The most common serotypes of salmonella reported in 1991 and 1992 are seen in Table 1.

There were 37 cases of *Yersinia enterocolitica* reported in 1992. The number decreased 22.9 percent from 48 cases reported in 1991 and increased 15.6 percent from the five-year median of 32 cases. As in previous years, the largest number of cases are still reported in the Eastern and Northwestern districts. See Figure 3.

Of the 36 *Yersinia* cases with race recorded, 77.7 percent were in those two districts and 50 percent were black. Among the black cases, 77.7 percent were in children four and under. In fact, 61.1 percent of cases among blacks were under one year of age. Children four and under made up 53.3 percent of the white cases; 26.6 percent of the white cases were under one year of age. Very young black children continue to be disproportionately affected by this relatively rare disease.

Parasites

Giardiasis decreased by 6.5 percent, from 790 cases in 1991 to 739 in 1992. The 1991 figure is the five-year median for giardiasis. Cases increased slightly in the Central, Southeastern and Southwestern districts. Decreases were seen in the other districts.

Table 1. Most common salmonella serotypes, Missouri, 1991 and 1992

1991			1992		
Serotype	No. of Cases	Percent	Serotype	No. of Cases	Percent
1. Typhimurium	144	23.4%	Typhimurium	113	26.5%
2. Heidelberg	65	10.6%	Enteritidis	47	11.0%
3. Braenderup	45	7.3%	Heidelberg	36	8.5%
4. Enteritidis	32	5.2%	Hadar	20	4.7%
5. Oranienburg	28	4.5%	Braenderup	11	2.6%
6. Newport	26	4.2%	Newport	11	2.6%
7. Hadar	21	3.4%	Thompson	10	2.3%
8. Poona	18	2.9%	Berta	6	1.4%
9. Thompson	17	2.8%	Montevideo	5	1.2%
10. Infantis	16	2.6%	Agona	4	0.9%
11. Agona	11	1.8%	Derby	4	0.9%
All Others	193	31.3%	All Others	159	37.4%
Total	616		Total	426	

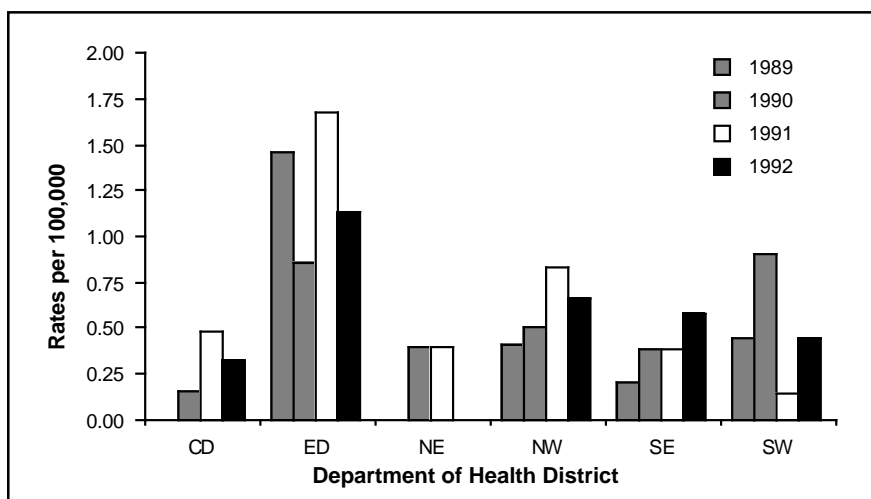


Figure 3. *Yersinia enterocolitica* rates by health district, Missouri, 1989-92.

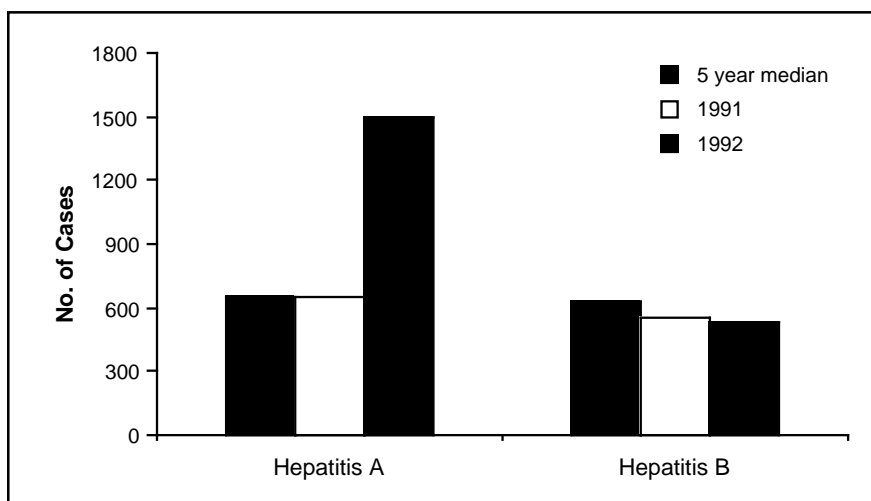


Figure 4. Hepatitis reports, Missouri, five-year median, 1991 and 1992.

Viral Hepatitis

A record number of cases of hepatitis A were reported in Missouri in 1992. Trends noted in the 1991 annual report continued, particularly a vast increase in cases from the Eastern district. State-wide, cases increased 129.7 percent, from 653 cases in 1991 to 1,500 in 1992. See Figure 4. The 1991 figure is the five-year median. Cases declined in the Central, Northwestern and Southeastern districts, but increased in all other districts. See Figure 5. Southwestern district demonstrated an increase of 608.8 percent and Eastern District showed an increase of 498.2 percent due to community-wide outbreaks in Joplin and St. Louis in 1992. Newton County in the Southwestern district had a waterborne outbreak with 35 confirmed cases.

Hepatitis B decreased by 2.5 percent, from 549 cases in 1991 to 535 in 1992. This is down 15.5 percent from the five-year median of 633 cases. See Figure 4. All districts reported decreases except the Eastern, which reported an increase of 49.0 percent. Eastern district was undergoing intensive surveillance and enhanced reporting of hepatitis due to the hepatitis A outbreak, which also affected hepatitis B reporting.

Meningitis

Aseptic meningitis, despite a 73.6 percent increase in the Northwestern district, decreased by 1.8 percent overall from 277 cases in 1991 to 272 in 1992. This is 21.9 percent higher than the five-year median of 223 cases. See Figure 6. Southeastern district showed a minor increase. All other districts reported a decrease in the number of cases.

Meningococcal meningitis, at 32 cases, is down 13.5 percent from 37 cases reported in 1991. See Figure 6. This is a 3.0 percent decrease from the five-year median of 33 cases. Eastern district reported 26.3 percent fewer cases in 1992. All other districts reported minor changes from 1991 to 1992.

Hib Disease

Hib meningitis decreased 47.6 percent, from 42 cases in 1991 to 22 in 1992,

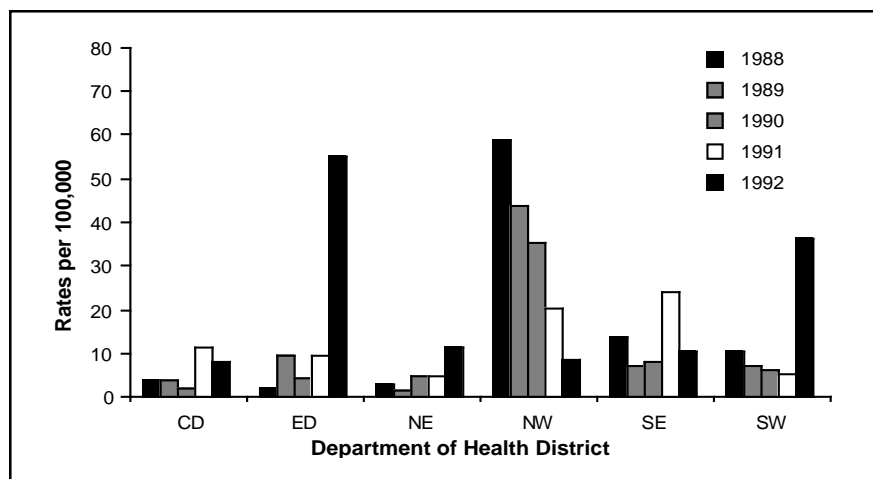


Figure 5. Hepatitis A rates by health district, Missouri, 1988–92.

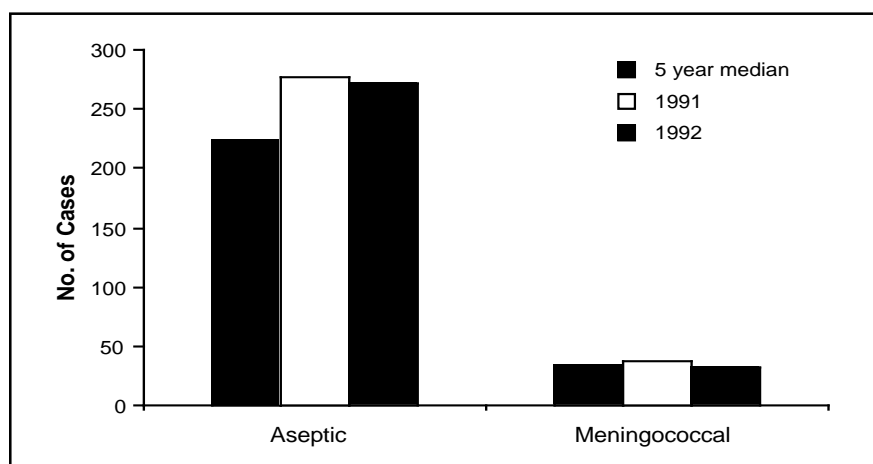


Figure 6. Meningitis reports, Missouri, five-year median, 1991 and 1992.

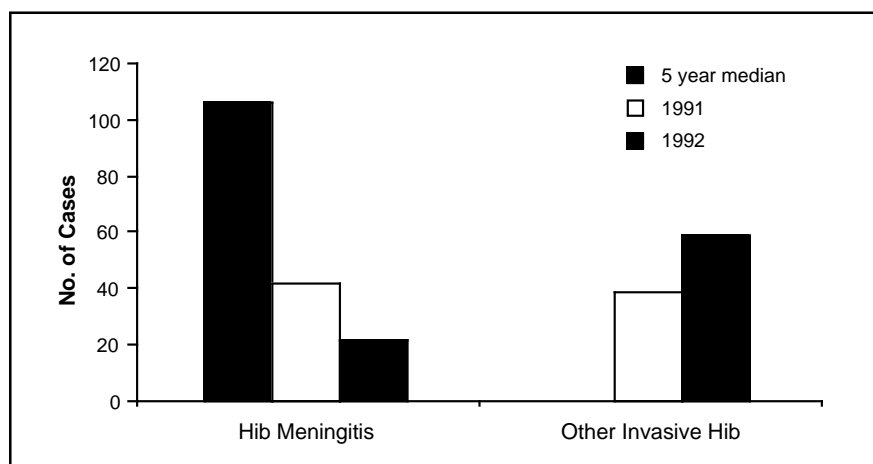


Figure 7. *Haemophilus influenzae* type b reports, Missouri, five-year median, 1991 and 1992.

despite an increased search for cases by the Invasive Bacterial Disease Surveillance Project. This is 79.2 percent lower than the five-year median of 106 cases. See Figure 7. Reported cases decreased in all districts. Detection of cases by the

surveillance project may explain the 51.3 percent increase in cases of other invasive Hib disease, from 39 cases in 1991 to 59 in 1992. Other invasive Hib disease has been reportable only since 1990, so there is no five-year median.

1992 Communicable Disease and Nosocomial Outbreaks

Michael Fobbs, B.A.

Mahree Fuller Skala, M.A.

Bureau of Communicable Disease Control

There were 41 communicable disease outbreaks reported in Missouri in 1992, involving 1,960 people. This represents a decrease of 16.3 percent from 49 outbreaks in 1991. These outbreaks involved many different modes of transmission, several widely varying etiologic agents and were found in a variety of settings. The modes of transmission were as follows: 16 were foodborne, 12 were suspected person-to-person transmission, 8 were unknown mode of transmission, 3 were waterborne and 2 resulted from occupational exposures.

Schools were reported as the setting for nine (22.0%) of the outbreaks, seven (17.0%) occurred in homes or family gatherings, six (14.6%) at catered events, four (9.8%) in daycare settings, four (9.8%) in restaurants, two (4.9%) in churches, two (4.9%) at workplaces, two (4.9%) in communities, one (2.4%) in a camp and one (2.4%) in a prison. Settings described as "other" were involved in three (7.3%) of the outbreaks.

The largest single outbreak was a community-wide outbreak of hepatitis A which affected 1,023 individuals. The outbreaks are shown in Table 1 by cause, setting and number of cases.

The largest portion of outbreaks was due to acute gastrointestinal illness of unknown etiology (AGI). Fifteen (15) outbreaks of AGI, affecting 311 people, were reported. Foodborne transmission was the most common mode, comprising 12 of these outbreaks. The other AGI outbreaks involved unknown modes of transmission. AGI occurred in the following settings: five catered events, four restaurants, two family gatherings, two schools, one church and one college fund-raiser.

Hepatitis A was reported as the causative agent for eight outbreaks, involv-

Table 1. Communicable disease outbreaks by cause, setting and number of cases, Missouri, 1992

Disease/ Mode of Transmission	No. of Outbreaks	Setting	No. of Cases
AGI*			
Foodborne	12	CH,5CT,FG,O,3R,S	280
Unknown	3	FG,R,S	31
Total	15		311
Hepatitis A			
Foodborne	1	S	7
Waterborne	1	CH	35
Person-to-Person	5	2C,DC,2FG	1,066
Unknown	1	S	3
Total	8		1,111
Giardiasis			
Person-to-Person	2	2DC	11
Unknown	2	2FG	10
Total	4		21
Shigellosis			
Foodborne	1	O	20
Waterborne	1	CA	11
Person-to-Person	1	DC	30
Unknown	1	FG	5
Total	4		66
Campylobacter			
Foodborne	1	CT	19
Occupational	1	W	20
Total	2		39
Salmonellosis			
Foodborne**	1	S	5
Occupational	1	W	3
Total	2		8
OTHER			
Person-to-Person			
Pediculosis	1	S	40
Infectious Mononucleosis	1	S	5
Influenza-like	2	2S	338
Water			
<i>Plesiomonas shigelloides</i>	1	O	2
Unknown			
Rash	1	P	23
Total	6		408
TOTALS	41		1,960
*Acute gastrointestinal illness of unknown etiology			
**Caused by <i>S. typhimurium</i>			
Key			
C	Community	DC	Daycare
CA	Camp	FG	Family Gathering
CH	Church	O	Other
CT	Catered Event	P	Prison
		R	Restaurant
		S	School
		W	Workplace

ing 1,111 people. One outbreak was transmitted by food and one by water. The other outbreaks of hepatitis A involved person-to-person transmission except for one with an unknown mode. Settings for hepatitis A outbreaks included two schools, two family gatherings, two communities, one day care center, and one church.

The parasite *Giardia lamblia* was reported for 21 people in four outbreaks. The outbreaks occurred in two day care settings with person-to-person transmission and in two separate homes where the mode of transmission was not established but water was the suspected source.

Shigellosis was reported as the cause of four outbreaks involving 66 people. Four different settings and modes of transmission were involved: waterborne transmission at a campground, person-to-person transmission in a day care center, foodborne transmission in a retirement center and unknown mode of transmission in a private home.

Salmonellosis was the causative agent in two outbreaks affecting eight people. There was a foodborne outbreak in a school and an outbreak among workers in a poultry processing plant.

Two outbreaks, involving 39 people, were caused by *Campylobacter*. Foodborne transmission at a catered affair was responsible for one outbreak and the other involved transmission at a poultry processing factory.

Two large outbreaks of influenza-like illness, with the usual person-to-person transmission, involved 338 people in two schools.

Single outbreaks due to a rash illness, *Plesiomonas shigelloides*, pediculosis, and infectious mononucleosis were also reported. The settings were two schools, one houseboat and one prison.

Hospitals, nursing homes, and other long-term care facilities reported 27 institutionally acquired (nosocomial) outbreaks in Missouri during 1992, a decrease of 44.8 percent from 1991. Alto-

Table 2. Nosocomial outbreaks and investigations by cause, setting and number of cases, Missouri, 1992

Disease/ Mode of Transmission	No. of Outbreaks	Setting	No. of Cases
Scabies			
Person-to-Person	11	H,10NH	116
Staphylococcus			
Surgical Wound Infection	1	H	4
Person-to-Person*	5	2H,3NH	32
Total	6		36
AGI**			
Person-to-Person	3	H,2NH	93
Meningococcal meningitis			
Unknown	1	NH	1
Person-to-Person	1	NH	1
Total	2		2
OTHER			
Person-to-Person			
Influenza	1	NH	22
ARI***	1	O	14
Pediculosis	1	NH	9
Pneumonia	1	NH	8
Medical Procedure			
<i>Enterobacter cloacae</i>	1	H	3
TOTALS	27		303
* Methicillin resistant <i>Staphylococcus aureus</i> ** Acute gastrointestinal illness of unknown etiology *** Acute respiratory illness of unknown etiology			
Key H Hospital NH Nursing Home O Other Extended Care Facility			

gether, 303 cases of illness were reported. Of the outbreaks, 25 were transmitted from person to person, one in some other unknown fashion and one via medical procedure.

Nursing homes were the setting for 20 (74.0%) of the outbreaks, hospitals for 6 (22.2%), and 1 (3.7%) was in another extended care facility.

Table 2 describes the outbreaks by cause, setting and number of cases.

Scabies accounted for 11 of the outbreaks. All of these occurred in nursing homes and were transmitted from person to person.

Staphylococcus outbreaks occurred six times, three in hospitals and three in

nursing homes. One was a cluster of surgical wound infections. The other five were methicillin resistant *Staphylococcus aureus* infections.

Outbreaks of acute gastrointestinal illness of unknown etiology occurred in two nursing homes and one hospital.

One case of meningococcal meningitis occurred in each of two nursing homes.

Single outbreaks of influenza, acute respiratory illness of unknown etiology (ARI), pediculosis, pneumonia and *Enterobacter cloacae* were reported. The ARI occurred in an extended care facility other than a nursing home. The *E. cloacae* infections were transmitted during a medical procedure.

Bureau of AIDS Prevention - 1992 Report

In 1985, the Department of Health was designated as the lead agency for all matters relating to HIV/AIDS. In response to that action, the department, as lead on the State Agency AIDS Task Force, developed statewide guidelines and published them in May 1986. In June 1987, the department established the Bureau of AIDS Prevention (BAP) and charged it with the primary responsibility for HIV/AIDS. Since then, all HIV/AIDS activities, policies and funding within the department have been managed by this bureau. BAP responsibilities range on a continuum from prevention and disease tracking to providing care and support services.

In 1990, utilizing a department-wide process that was combined with major input from various community representatives, Year 2000 Objectives were drafted. The objectives were published during 1992 in *Healthy Missourians 2000*. These objectives are used as a basis for program decision making and funding requests. These objectives are printed on pages 8 and 9 of this issue.

The importance of community involvement in the bureau's activities cannot be overstated. The bureau has ongoing relationships with a variety of governmental agencies and private organizations through contractual or other agreements. Input from many agencies/orga-

nizations and/or individual persons is sought prior to development and implementation of bureau policies and programs.

Infection with the **Human Immunodeficiency Virus (HIV)** marks the beginning of a chronic disease process. See Figure 1. It is during the latter stages of HIV disease that individuals are diagnosed as having **Acquired Immunodeficiency Syndrome (AIDS)**. The diagnosis of AIDS requires the presence of certain specific diseases, conditions and/or laboratory findings. Their presence indicates that severe damage has occurred to the immune system. It is estimated that the lifetime cost of treating a person with HIV disease from the time of infection until death is approximately \$119,000. The estimated cost of treating all HIV-infected persons is expected to increase by 48 percent between 1992-95.

In Missouri, AIDS has been a reportable condition since 1983. In October 1987, HIV infection became reportable. Through 1992, AIDS cases totaled 3,214 and reported HIV infections totaled 5,124. See Figures 2 and 3. It is estimated that an additional 7,000-10,000 Missourians are infected with HIV. The vast majority of these persons have only minor symptoms or no symptoms at all;

they may or may not be aware of their infection.

Missouri ranks 16th among the states in annual AIDS incidence (12.6 per 100,000). Sexual contact between men is the primary route by which Missouri AIDS cases have acquired their infection. In contrast to what is occurring for the nation as a whole, the annual incidence of Missouri cases associated with this risk behavior is, so far, continuing to rise at a very noticeable rate. Although the numbers of cases attributable to injecting drug use and heterosexual contact remain relatively low, the overall trends over the past few years have generally been upward. If these trends continue, it is obvious that these routes of transmission will, in time, come to contribute to significant numbers of new AIDS cases. In addition, such trends would be expected to mean that an increasing proportion of cases will be in women, and that blacks and Hispanics will come to be even more disproportionately represented among Missouri AIDS cases.

In addition to AIDS case reports, the department continues to receive in excess of 100 new reports of HIV infection (persons newly testing positive for HIV) per month. These individuals represent those who may develop AIDS within the next ten years.

Figure 1. Stages of HIV Disease

Initial Infection	AIDS Diagnosed			
	Death			
Acute Retroviral Syndrome and Appearance of HIV Antibody	Period of Asymptomatic Infection			
	Early Symptomatic Period	Late Symptomatic Period	Advanced Disease Period	
Typical Duration:	10+ Years	0-5 Years	0-3 Years	1-2+ Years
CD4 Lymphocyte Count:	1,000	500	200	50

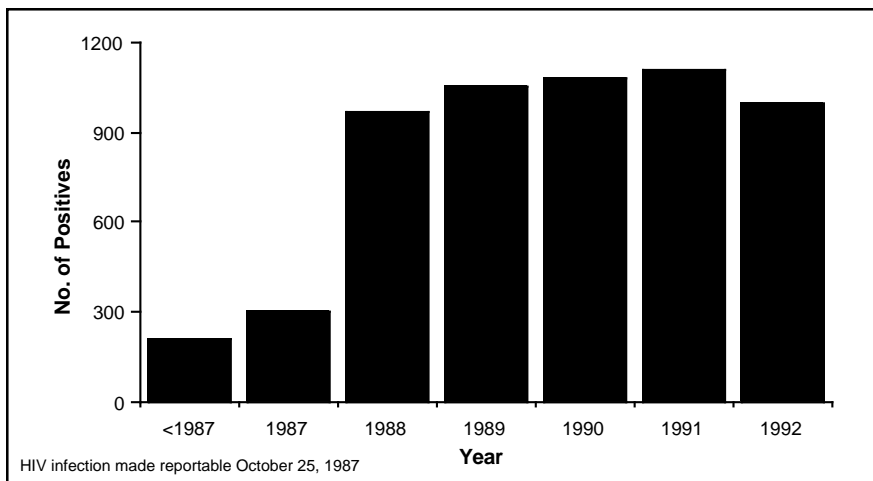


Figure 2. Named HIV infections by year of first positive test, Missouri, up to 1992.

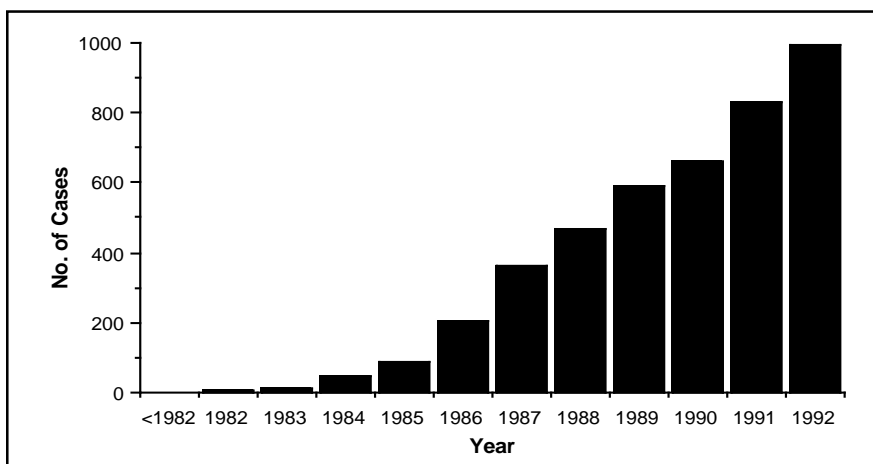


Figure 3. AIDS cases by year of diagnosis, Missouri, up to 1992.

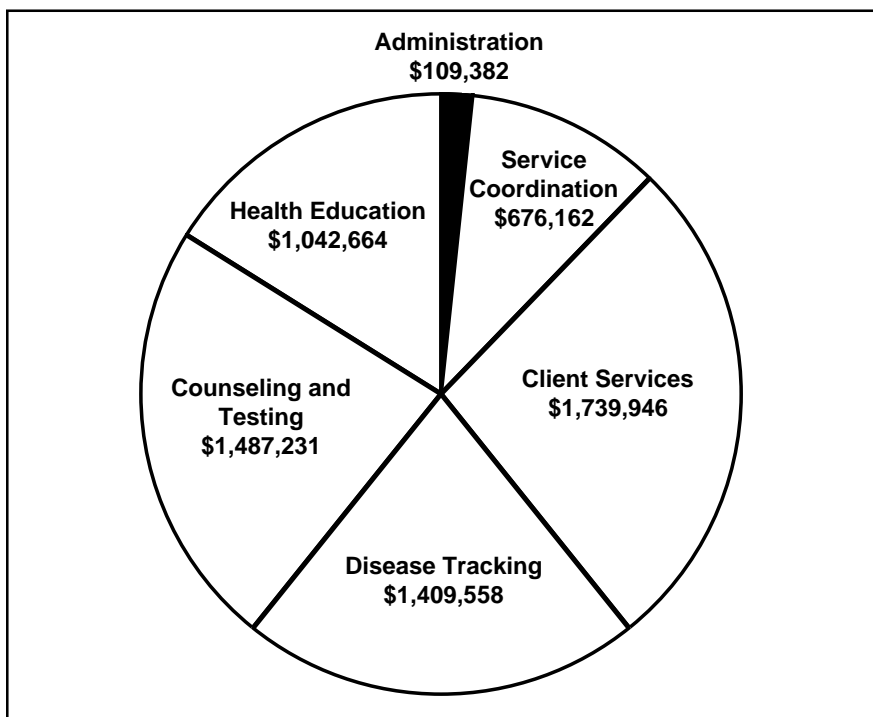


Figure 4. Distribution of AIDS funding, Missouri, 1992.

HIV/AIDS PROGRAMS

The bureau uses state and federal funds to support its comprehensive HIV/AIDS prevention and care programs. During fiscal year 1992, the bureau received \$6,464,943. Of this amount, \$1,321,051 was from state general revenue funds and \$5,143,892 was from 10 federal grants. See Figure 4.

Health Education/Risk Reduction

The bureau, through contracts with local health departments and community-based organizations, provides health education/risk reduction services to:

- reduce the spread of HIV infection by directing culturally sensitive risk-reduction messages to persons engaging in high-risk behaviors ranging from unsafe sex practices to injecting drug use.
- furnish information to persons already infected in an effort to help them maintain their health and protect the health of others.
- furnish information to the general public to increase awareness of risk, reduce myths and increase the overall level of compassion for persons with HIV infection.

The bureau also provides a free resource library containing HIV-prevention pamphlets, posters and videos. A toll-free AIDS information line is staffed by bureau personnel.

Disease Tracking

Missouri law requires that, in addition to persons with diagnosed AIDS, all other HIV-infected persons be reported to the department. HIV-infection reporting is important because of the lengthy period of time between infection and the development of AIDS. This time can average eight to ten years. Thus, the tracking of AIDS cases alone would be very misleading in describing recent trends in transmission or predicting future funding and resource needs.

Tracking HIV infection allows the bureau to:

- monitor trends in populations at risk.
- target prevention-oriented activities such as counseling, testing and general education initiatives.
- identify individuals who qualify for direct care and/or partner notification services.
- project the future trends of the epidemic and the needs of those affected.

Counseling and Testing

Since August 1985, the bureau has provided free, voluntary HIV counseling and testing to individuals at 60 sites statewide. These sites are integrated into settings such as sexually transmitted disease clinics, local health departments and women's clinics. A person identified as HIV-infected by a counseling and testing site, or reported through disease-tracking activities, is referred into the statewide Service Coordination System. Interaction with participants is ongoing to reinforce prevention messages, assure access to needed services and assist in prevention of HIV-related diseases.

Identification of HIV infection allows for early intervention, which helps HIV-infected persons:

- receive reinforcement for healthy behaviors.
- access early medical care and services so they can live longer, more productive lives.
- inform their partners of possible exposure so they can seek medical attention

and, if infected, avoid spreading the virus to others.

The counseling and testing program also targets high-risk clients who are not HIV-infected and provides them with services that can assist them in changing high-risk behaviors.

Service Coordination

Service coordination, first funded by the legislature in 1989, is a statewide system of case management that has served over 2,300 persons with HIV/AIDS. Service coordination promotes effective and efficient access to comprehensive services through teams of registered nurses and social workers who:

- locate and expedite access to medical and psychosocial services.
- assist clients applying for entitlement programs such as SSI, SSDI, AFDC, food stamps and AIDS Medicaid Waiver.
- authorize services provided through bureau programs.
- coordinate services to prevent duplication and fragmentation.
- monitor and assure quality of services.

Service coordination teams are comprised of bureau employees, as well as staff from local health departments and community-based organizations subcontracted by the bureau. All team members engage in joint case conferences and operate under the same policies and protocols.

Service coordinators work one-on-one with HIV-infected persons throughout

the state. Service coordination teams operate out of Kansas City, St. Louis, Columbia, Springfield, Joplin, St. Joseph, Kirksville and Poplar Bluff.

Client Services

Client services purchases physician, home care, mental health, dental care and nutritional services as well as transportation, medications and housing. Since 1987, services have been purchased for over 3,000 individuals. Based on a local needs assessment, a consortium of providers and consumers advises the bureau on issues such as eligibility criteria for services and types of services offered. The consortium includes representatives from St. Louis, Kansas City and outstate regions of Missouri. Persons with HIV/AIDS access client services through the Service Coordination Program.

Client Services:

- provides payment for community-based and outpatient services which are not affordable to the client.
- fills gaps in services.
- seeks to promote cost-effective service delivery.

In summary, the health of our population is too great a resource to waste. The bureau, in partnership with individuals, community-based organizations and local, state and federal agencies, continues to take an active role in implementing comprehensive programs that address the needs of individuals along the continuum, which ranges from HIV prevention through care and support.

Year 2000 Objectives for HIV/AIDS Activities		
Objective	Special Targets	MO Baseline
By the year 2000, no fewer than 99 percent of persons at increased risk for HIV infection will have access to HIV counseling and testing within their geographic area.		90%
By the year 2000, no fewer than 95 percent of those infected with HIV and wanting HIV service coordination will have access within their geographic area.	Infected individuals residing in non-metropolitan areas	95%
By the year 2000, no less than 99 percent of individuals disabled by HIV who need housing and are enrolled in HIV service coordination will have access to safe and affordable housing.		99%

Objective	Special Targets	MO Baseline
By the year 2000, 80 percent of reported individuals with HIV infection will be seen by a physician within three months of first identification of infection.	a. Low income individuals b. Non-insured and under-insured individuals	Base to be established
Increase to 80 percent the proportion of public clinics serving persons with HIV disease that screen, diagnose, treat, counsel, provide referral and provide partner notification services.	a. Primary care b. Family planning c. Maternal and child health d. Sexually transmitted disease clinics e. Drug treatment centers f. Others	Base to be established
By the year 2000, confine the annual incidence of new HIV infections in Missouri to no more than 12 per 100,000 population and confine annual incidence of diagnosed AIDS cases in Missouri to no more than seven per 100,000.		As of 12/91: HIV=25.39 per 100,000 AIDS=12.8 per 100,000
By the year 2000, 99 percent of persons identified at high risk for exposure to HIV infection will be counseled concerning its transmission and prevention, as well as the desirability for testing and early intervention for the purpose of changing their behaviors.		95%
Through HIV-prevention programs that promote and distribute condoms, increase the proportion of sexually-active people at risk for HIV infection seen at publicly-funded clinics that report using a condom during their last sexual intercourse/or that report increased frequency in condom use.	a. Injecting drug users b. Youth c. Individuals with multiple sex partners d. Men who have sex with men e. Women of childbearing age	Base to be established
By the year 2000, no less than 99 percent of the locatable, non-compliant individuals who continue to place others at risk for HIV infection will have access to programs that assist them in changing their behaviors.	a. Individuals who are dually diagnosed (HIV and addiction or mental illness) b. Homeless individuals with HIV	99%
By the year 2000, increase to 95 percent the number of individuals at risk for HIV infection who understand the modes of HIV transmission.	a. Injecting drug users b. Sexually active youth c. Individuals with multiple sex partners d. Men who have sex with men e. Women of childbearing age	88%
By the year 2000, no less than 95 percent of all health care providers will have access to the latest official guidelines for: (a) diagnosis and treatment of HIV/AIDS; (b) prevention of occupational transmission of HIV.	For part (a), physicians in a. General Practice b. Family Practice c. OB/GYN	95%
Through collaborative community efforts increase to 95 percent the proportion of public and private schools that provide HIV education to students in grades 7–12.		53%
Through collaborative community efforts provide HIV education for students and staff in at least 95 percent of the colleges and universities, both public and private.		Base to be established
By the year 2000, 99 percent of diagnosed AIDS cases and 95 percent of HIV cases will be reported.		AIDS=95% HIV=50%

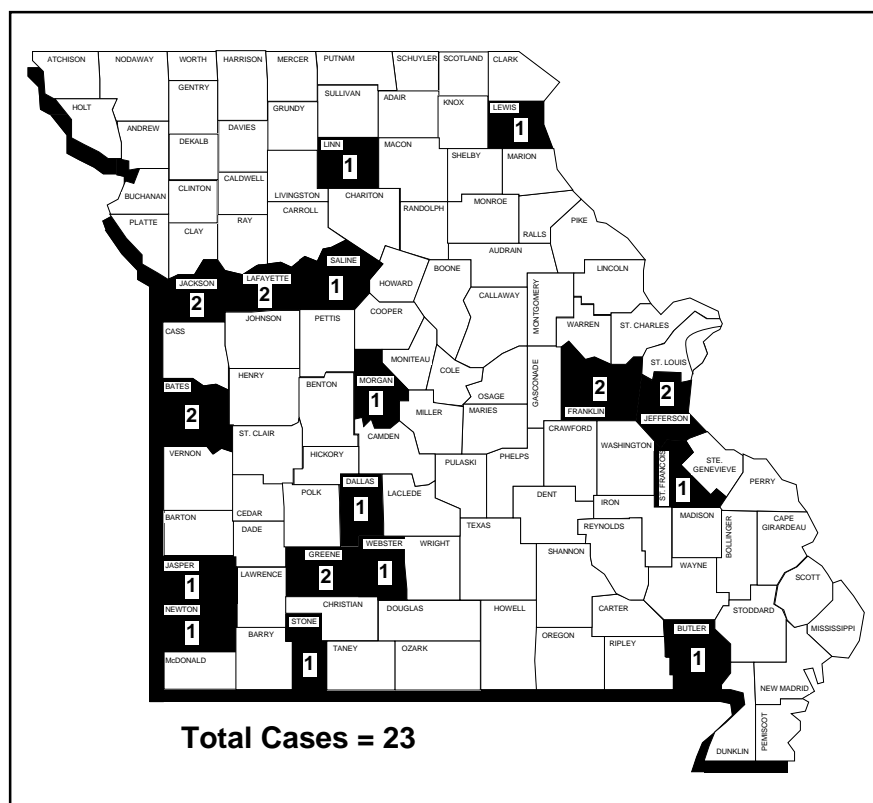
Tick-Borne Disease Summary - 1992

F.T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever (RMSF) is a rickettsial disease of man, transmitted to man via the tick, *Dermacentor variabilis*. This tick is the reservoir for RMSF. Onset of the disease occurs 3-14 days after the infected tick has had a blood meal on the susceptible individual. The organism is maintained in the mid-gut of the tick and is passed into the individual during the feeding process. It is also passed in tick fecal material and individuals can be infected by brushing the organism into abraded skin. Person to person transmission does not occur. The disease is characterized by flu-like symptoms of fever, headache, malaise, myalgia and usually a maculopapular rash which appears on the palms and soles. The disease can be diagnosed by clinical signs and the CF or IFA test. The mortality rate can be as high as 15-20 percent in untreated cases. A four percent mortality is common. Missouri has averaged 30-40 cases of RMSF per year during the last decade.

Missouri had 23 cases of RMSF in 1992 with the cases distributed throughout the state, thus validating the endemicity of RMSF throughout Missouri. See Figure 1. Prompt diagnosis and appropriate treatment is of utmost importance in preventing mortality. Laboratory confirmation and reporting to the state health department allows notification of other health professionals to be aware of this disease in their locality. Simple IFA and CF tests are high in sensitivity and specificity and are economical. These tests are available through the State Public Health Laboratory. More sophisticated and costly tests are not usually required. Utilization of easily available, timely testing allows for confirmation of the presence of RMSF in an area and initiation of preventive intervention such as spot spraying to eliminate ticks.



Tularemia

Tularemia is a bacterial disease of wild-life and man. Wild rabbits are the primary reservoir. It is transmitted to man primarily through the blood meal of an infected tick or by direct contact with the organism while skinning or cleaning an infected wild rabbit. Infection can occur from contact with the organism either in contaminated water or meat or from the mouth of an animal which has just consumed infected meat. The disease manifests itself with an indolent ulcer at the site of inoculation and regionally enlarged painful lymph nodes. Other routes of infection produce specifically-related signs and symptoms. The disease can progress to systemic and pulmonary manifestation with a case fatality rate of five to ten percent. Missouri and the Ozark Plateau are endemic for tularemia, and Missouri and Arkansas usually lead the nation in total number of cases. Missouri has averaged 50-60 cases a year during the last decade, with half the cases being transmitted from tick bites and half from contact with infected rabbits. Missouri had 34 human cases of tularemia in 1992, with all but three cases occurring south of the Missouri River. See Figure 2.

Ehrlichiosis

Ehrlichiosis is an acute febrile illness of humans caused by *Ehrlichia chaffeensis* and thought to be transmitted by the brown dog tick, *Rhipicephalus sanguineus*. As with other tick-borne diseases, it has an acute onset with flu-like symptoms including headache, myalgia, anorexia, nausea and, in some instances, a rash. Clinical laboratory abnormalities include leukopenia, thrombocytopenia and elevated levels of hepatic aminotransferase. The causative organism, *Ehrlichia chaffeensis*, was isolated in 1991 in Arkansas. Missouri has had a total of 71 cases since 1988, which averages 14.2 cases per year, and more than any other state. See Figure 3. Twenty-one cases were reported in 1992. See Figure 4. Elevation of liver enzymes makes this disease easier to diagnose. Serological tests are available through CDC.

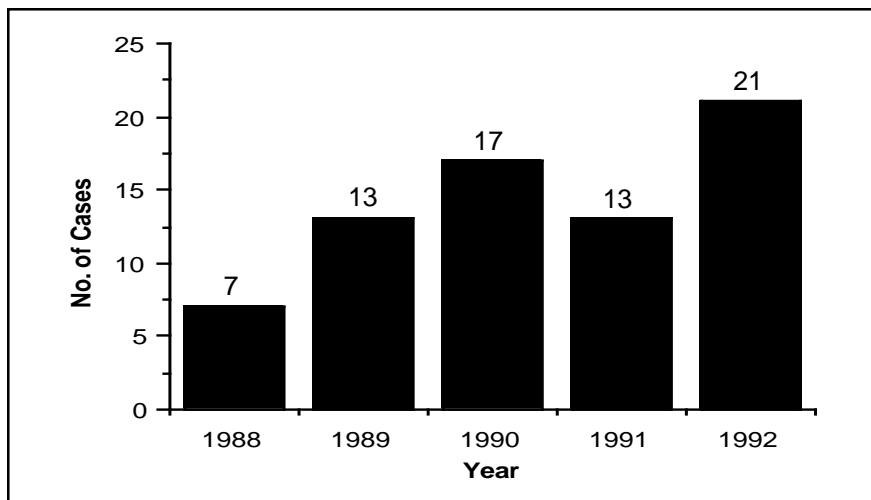


Figure 3. Ehrlichiosis cases by year of report, Missouri, 1988-92.

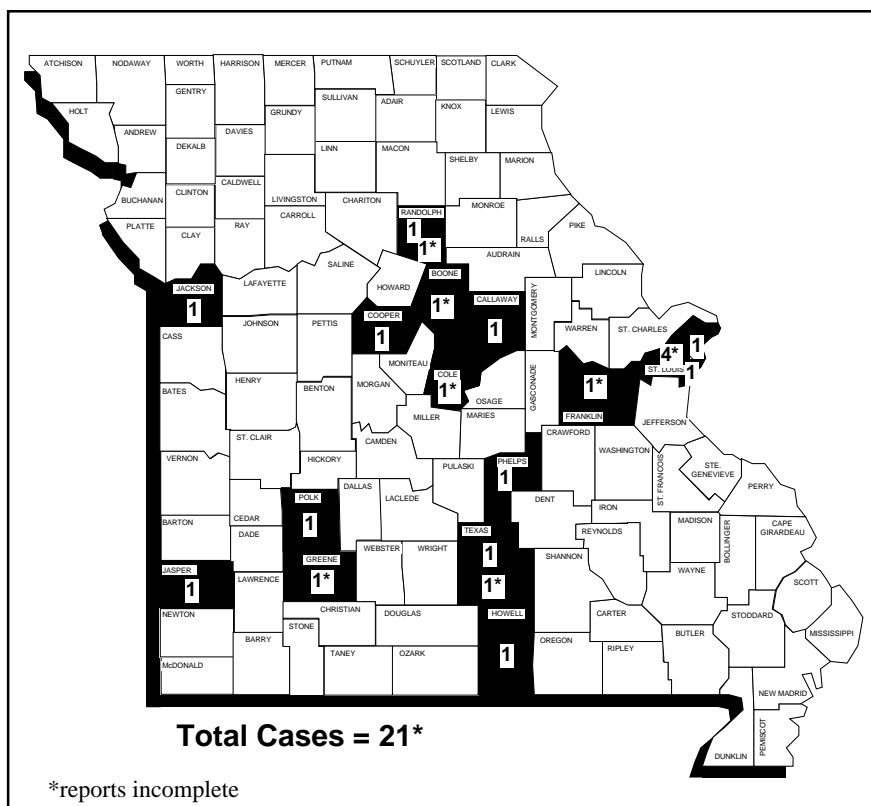


Figure 4. Ehrlichiosis cases, Missouri, 1992.

Lyme Disease

A bacterial illness transmitted by ticks to wildlife and man, Lyme disease has become the most commonly reported vector-borne disease in the United States with as many as 90 percent of all cases being reported from the northeastern United States. The tick most commonly reported as the vector for Lyme disease

is *Ixodes scapularis* (formerly *Ixodes dammini*). *I. scapularis* is not common in Missouri. Other possible vectors include *Amblyomma americanum* (the Lone Star tick) and *Dermacentor variabilis* (the dog tick).

Missouri has averaged over 165 cases per year since 1989 when Lyme disease

(continued on page 12)

Table 1. Lyme disease cases in Missouri

Year	Suspects Reported	Definite	
		Exposed in Missouri	Exposed Elsewhere
1983	1	0	0
1984	10	0	2
1985	6	1	0
1986	5	0	1
1987	30	4	0
1988	38	4	1
1989	213	106	2
1990	420	194	11
1991	415	200	7
1992	466	142	8
Total	1,604	651	32

became reportable in the state. See Table 1. The case definition developed by the Council of State and Territorial Epidemiologists and the Centers for Disease Control and Prevention is utilized. There were 150 cases reported in 1992 that met this definition.

Onset of illness may occur 3-30 days after the infected tick has had a blood meal (become engorged). Early disease may include an erythema migrans rash, flu-like symptoms or fever. Erythema migrans is a common presentation of early disease in 60-80 percent of cases.

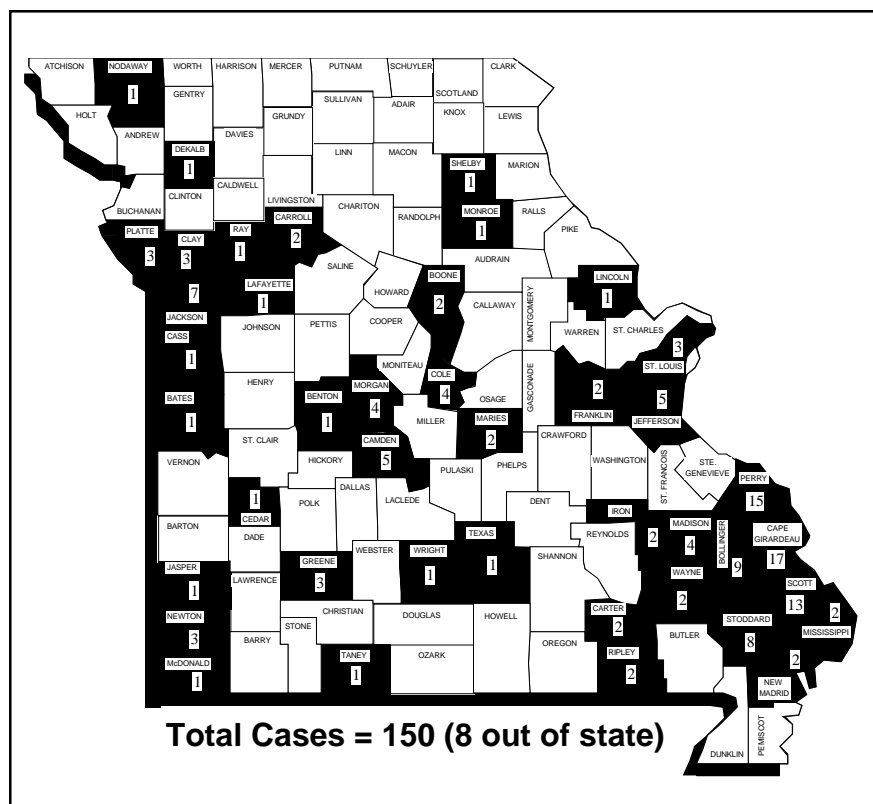


Figure 5. Lyme disease cases, Missouri, 1992.

Lyme disease is a multisystemic illness capable of affecting the joints, heart and the nervous system. Arthritis is its most common expression in late stages.

Since serological testing is not yet standardized, the clinical findings provide the best mechanism for diagnosis of Lyme disease.

EPA Regulations Help Reduce Pesticide Poisoning

Paul Andre
Missouri Department of Agriculture

Agricultural workers and pesticide handlers working on farms and in forests, nurseries and greenhouses will receive increased protection from pesticide poisoning under amendments to the U.S. Environmental Protection Agency's (EPA) Worker Protection Standards (WPS). All provisions, including portions of the amendments that provide assistance to medical personnel treating pesticide poisoning victims, take effect in April 1994.

In the event of a pesticide-related injury, employers are required to make available transportation to an emergency

medical facility. Upon request by medical personnel, employers must provide:

- information about the pesticide (name, active ingredient, etc.)
- antidote, first aid and other medical information from the label
- circumstances surrounding the application
- circumstances of the individual's exposure

Medical personnel may want to obtain a copy of the label or a clean pesticide container with an intact label.

Medical facilities should also obtain more definitive medical information than that found on the pesticide label. This type of information should be available

through Poison Control (in Missouri) at (800) 392-9111; Chemtrec at (800) 424-9300; or the National Pesticide Telecommunications Network (weekday hours only) at (800) 858-7378. Many pesticide labels also contain telephone numbers for contacting the manufacturer.

Other stipulations in the WPS require that employers provide their workers and handlers with pesticide training, personal protection equipment and decontamination materials. Employers are required to notify their workers of those locations where pesticides are being applied and where access is thus prohibited. Workers must also be notified of

(continued on page 23)

Bimonthly Morbidity Report, May/June 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Bimonthly Morbidity Summary, May/June 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Bimonthly Morbidity Report, July/August 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Bimonthly Morbidity Summary, July/August 1993

(not available electronically—a paper copy can be obtained from the Office of Epidemiology at (573) 751-6128)

Vaccine-Preventable Diseases - 1992

Marilyn Kemna
Bureau of Immunization

In 1992, Missouri reported 120 cases of *Bordetella pertussis*, an increase of 45 percent over the 83 cases reported in 1991. The majority of cases were reported in the metropolitan areas of Kansas City, St. Louis City and St. Louis County. Of the cases reported, 62 (52%) involved infants under one year of age. Additionally, 92 of the cases (77%) were reported in children under age five. Sixty-two of the cases (52%) occurred in unimmunized or inadequately immunized individuals. Figure 1 shows the vaccination status and age at time of onset.

Incidence of *Haemophilus influenzae* b (Hib) disease remained at 81 cases for a second year. Reports of Hib meningitis decreased significantly from 42 cases in 1991 to 22 cases in 1992. Figure 2 shows the incidence of Hib meningitis from 1982–92. Incidence in children less than one year of age decreased from 22 cases in 1991 to six cases in 1992. Other invasive disease with Hib increased from 39 cases in 1991 to 59 cases in 1992. Continued widespread use of Hib vaccine in preschool age children should contribute to reducing the incidence of Hib disease in Missouri.

Missouri remained measles-free in 1992 compared to one case reported in 1991. Continued enforcement of the second measles immunization requirement for children starting kindergarten as of or after the 1990–91 school year, making MMR vaccine available to college freshmen and enforcement of the day care law requiring attendees to be age-appropriately immunized should continue to influence measles morbidity in the state.

Incidence of rubella decreased from five cases in 1991 to one case in 1992.

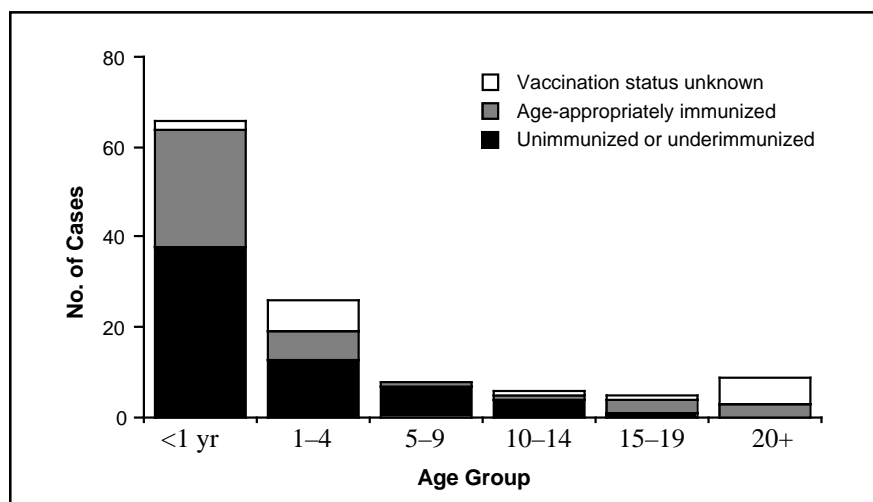


Figure 1. Reported pertussis cases by age and vaccination status, Missouri, 1992.

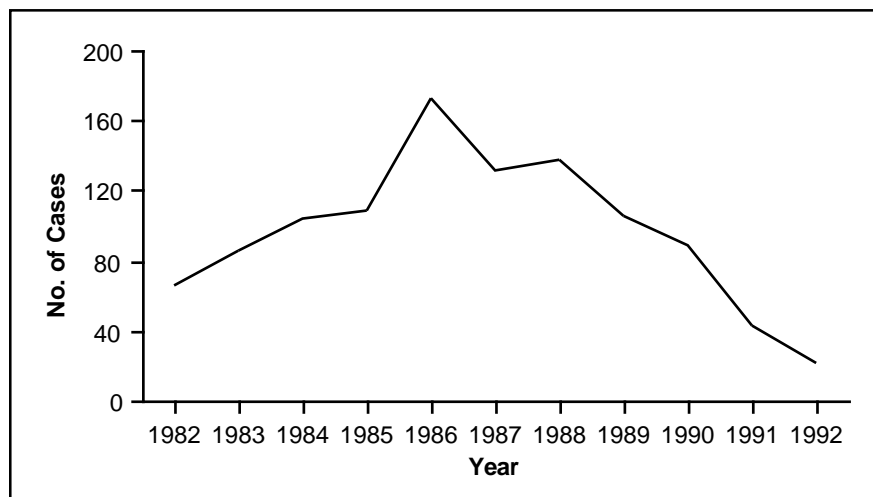


Figure 2. Reported cases of *Haemophilus influenzae* type b meningitis disease, Missouri, 1982–92.

In 1992, one case of tetanus was reported. The case was reported in an unimmunized, 12-year-old Amish male who recovered from the disease. Siblings of the case were also unimmunized; vaccine was offered to the family, but was refused.

Mumps incidence decreased only slightly from 40 cases in 1991 to 39 cases in 1992. Enforcement of the school immunization law could significantly affect the incidence of mumps during the next several years. Legislation passed

in 1992 now requires one dose of live mumps vaccine received on or after the first birthday for all students attending school during the 1993–94 school year.

It is important to note that, although the incidence of many of the childhood vaccine-preventable diseases has decreased during the last two years, only 49 percent of Missouri's children are appropriately immunized at age two years. Until this level is raised, outbreaks of vaccine-preventable diseases are likely to recur periodically.

Tuberculosis in 1992: Continuing Concern for the Very Young, Elderly, Minorities and the Foreign-Born

Arlon Meyer Jr., M.P.H.
Bureau of Tuberculosis Control

Tuberculosis in Missouri for 1992 was a scenario of good news and bad news. The good news was that the number of reported cases of tuberculosis decreased by 3.5 percent from the previous year. Missouri experienced 245 case of tuberculosis in 1992 (a case rate of 4.7 per 100,00 population). This is in comparison to 26,673 cases of tuberculosis occurring in the United States in 1992 (a case rate of 10.5 per 100,000 population), which was an increase of 1.5 percent over the previous year. The bad news was that some areas of Missouri had increases in the number of cases of tuberculosis. See Table 1.

It should be noted that the incidence of tuberculosis increased by 12 cases, or 12.6 percent, in the major metropolitan areas of St. Louis City, St. Louis County and Kansas City during 1992. However, in the outstate areas of Missouri, where the major portion (56.3%) of the cases were reported in 1992, the number of cases decreased by 21 (-13.2%).

There was bad news concerning tuberculosis for various high-risk groups in 1992. Specifically, the incidence of tuberculosis increased for the very young, those over 45, African-Americans, Asians, and foreign-born.

In 1992, the percentage of cases in African-Americans increased by 9.4 percent, accounting for 28.6 percent of the total reported cases. The percentage of cases in Asians increased by 5.3 percent, which was 8.2 percent of the total reported cases. In the metropolitan areas of Kansas City, St. Louis City and St. Louis County, the incidence of disease is greatest among minorities ranging from 58.3 percent of the total cases in Kansas City to 68.8 percent of the total cases in St. Louis County.

Table 1. Tuberculosis cases by geographic area, Missouri, 1991 and 1992

	1992	1991	Change	%Change
St. Louis City	44	33	+11	+33.3
St Louis County	39	31	+8	+25.8
Kansas City	24	31	-7	-22.6
OUTSTATE	138	159	-21	-13.2
Northwestern	10	9	-1	+11.1
Northeastern	10	5	+5	+100.0
Central	27	26	+1	+3.8
Southeastern	36	38	-2	-5.3
Southwestern	37	52	-15	-28.8
Eastern	7	16	-9	-56.3
Institutionalized Patient	11	13	-2	-15.4
Total	245	254	-9	-3.5

The rate of disease among minorities statewide was 15.3 per 100,000 population in 1992. Specifically, the rate for African-Americans was 12.8 per 100,00 population and the rate for Asians was 50.5 per 100,00 population. In comparison, the rate of disease for whites was 3.5 per 100,000 population. The rates of disease indicate that the state's minority populations are nearly four times as likely as whites to contract tuberculosis.

In 1992, significant changes in the incidence of tuberculosis in various age groups occurred. The number of cases in the 0-4 year age group doubled over 1991. The 15-24 age group had a 14.3 percent increase over the previous year and the 45-64 age group experienced a 31.4 percent increase. Those 65 and older had a 22.9 percent decrease. See Table 2.

The 100 percent increase in cases of tuberculosis in children aged 0-4 years may reflect increasing rates of transmission of tuberculosis among adults. A cause for the increasing cases among those in the 15-24 age group is probably reflected by the greater occurrence of persons infected with human immunodeficiency virus (HIV) and substance abuse.

Reasons for increasing numbers of cases in those aged 45-64 include such socioeconomic factors as limited access to health care, poverty, substandard housing and homelessness. A contributing factor to the decreasing numbers of cases in those over 65 is possibly due to the weakening immune system of those who were previously infected with tuberculosis (weakening due to immunosuppression, alcohol/substance abuse and other socioeconomic factors such as nutrition and lack of proper health care).

In 1992, the ratio of tuberculosis cases in males to tuberculosis cases in females was 1.6:1. This compares to the 1.9:1 male to female ratio for the United States in 1992. The increase in ratio of males to females (1.4:1 in 1991) is due in part to the 9.5 percent decrease in the number of female cases of tuberculosis in 1992.

Lastly, an increasing number of cases of tuberculosis are occurring among foreign-born individuals. In fact, the number of cases among foreign-born increased from 25 in 1991 to 29 in 1992. These 29 foreign-born cases accounted for 11.8 percent of the total cases in Missouri in 1992. In comparison, in 1992 the foreign-born accounted for 27.3

Table 2. Changes in the number of reported tuberculosis cases by patient age, race, sex and country of origin, Missouri, 1991 and 1992.

Patient Characteristics	1992	1991	Change	Percent % Change
Age				
0-4	10	5	+5	+100.0
5-14	2	5	-3	-60.0
15-24	8	7	+1	+14.3
25-44	67	68	-1	-1.5
45-64	67	51	+16	+31.4
65 +	91	118	-27	-22.9
Race				
White	155	171	-16	-9.4
Black	70	64	+6	+9.4
Asian	20	19	+1	+5.3
American Indian	0	0	0	0
Sex				
Male	150	149	+1	+0.7
Female	95	105	-10	-9.5
Country of Origin				
United States	216	229	-13	-5.7
Asian Countries	20	19	+1	+5.3
African Countries	3	2	+1	+50
European Countries	4	0	+4	*
Caribbean	1	2	-1	-50
South American	0	1	-1	-100
Central American	1	1	0	0
*Undefined				

percent of the total cases of tuberculosis in the United States.

Summarizing 1992, tuberculosis cases increased among some racial/ethnic minorities, foreign-born persons, those 0-4 years of age, those 15-24 years of age and those 45-64 years of age. Reasons for the greater occurrence of tuberculosis among these groups may be due in part to:

- infection with HIV
- immigration from countries with a high incidence of tuberculosis
- primary transmission within these groups
- substance abuse
- limited access to health care
- poverty
- substandard housing
- homelessness

Because the risk for developing active tuberculosis is greatly increased due to HIV-related immunosuppression, the bureau recommends that HIV-infected

persons be screened for tuberculosis and latent tuberculosis infection and, if infected, be started on the appropriate therapy or preventive therapy. Also, persons who have tuberculosis or are tuberculin skin test positive should be evaluated for HIV infection so that appropriate treatment and/or counseling can be initiated.

The Bureau of Tuberculosis Control has expanded its surveillance to include information on risks for acquiring tuberculosis (including immunosuppressions), for noncompliance with therapy, outcomes of therapy and drug sensitivity results.

The bureau's goal for Missouri is to decrease the number of cases to 175 by the year 2000 and then to 5 cases by the year 2010. For discussion of multidrug-resistant tuberculosis, see the March-April 1993 issue of the *Missouri Epidemiologist*.

Dan Ruggiero Appointed New Chief, Bureau of Tuberculosis Control

Bernard R. Malone, M.P.A.

*Division of Environmental Health
and Epidemiology*

Effective June 14, Donato "Dan" Ruggiero was appointed by the Centers for Disease Control and Prevention (CDC) and the Department of Health as the chief of the Department's Bureau of Tuberculosis Control. Dan's responsibilities will include planning and coordinating the agency's tuberculosis control program during this important time when the increased incidence of drug resistance looms dangerously in the future. In this capacity, he will work under the direction of William R. Schmidt, M.P.H., Director of the Division of Environmental Health and Epidemiology.

Dan's academic training was received in New York, where he received a bachelor of arts degree from City College of New York with a major in political science. He completed his masters in health services administration from the New School for Social Research in New York. He served as an employee of the New York City Health Department for the past 20 years, with nearly 18 years in tuberculosis control activities. Prior to joining the CDC Tuberculosis Program, Dan held the responsible position of chief administrator for tuberculosis control activities for the City of New York Health Department. In this capacity, he was responsible for surveillance, reporting and outreach services for the over 3,000 cases of tuberculosis reported in that city.

The Department of Health is pleased to have a person with this level of expertise in tuberculosis control services. Dan and his family are expected to live in Jefferson City, Missouri. Dan can be reached in the Bureau of Tuberculosis Control at (314) 751-6122.

Rabies Summary 1992

*F.T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health*

The number of cases of animal rabies in Missouri increased from 28 cases in 1991 to 37 cases in 1992, a 32 percent increase. This is far below the average of 85 cases of animal rabies per year which occurred during the decade of the 1980s. While there is no reason for anxiety or panic, there is reason for concern.

The adjacent states of Kansas and Oklahoma have experienced epizootics of skunk rabies. Kansas had a total of 374 cases of animal rabies in 1992, 335 of which were in skunks. This represents an approximate increase of 800 percent. Oklahoma had 178 cases of skunk rabies. Rabies continues to be endemic in the midwest and cycles at various intervals, depending on the susceptibility of the population. When the ecological habitat of the reservoir of rabies extends across the boundaries of another state, the epizootic spreads into that state. Oklahoma had an epizootic of skunk rabies in 1991 (126 cases) that continued in 1992, increasing to 178 cases. It is likely that the 1992 skunk epizootic in Kansas (335 cases) is an extension of the Oklahoma epizootic. Rabies was present in six contiguous Kansas/Missouri counties in 1992. Vigilant surveillance in western Missouri is required to detect movement of that epizootic into Missouri.

Figure 1 shows the rabies distribution by number of cases and species of wild and domestic animals in Missouri in 1992. Two dogs and one cat were the only domestic animals affected.

The numbers of rabies cases in skunks and bats are shown in Figures 2 and 3. With only six cases of skunk rabies in 1992, skunk rabies is at an all time low. Since the skunk is the main reservoir of rabies in Missouri, this low prevalence in the skunk population affects the spill

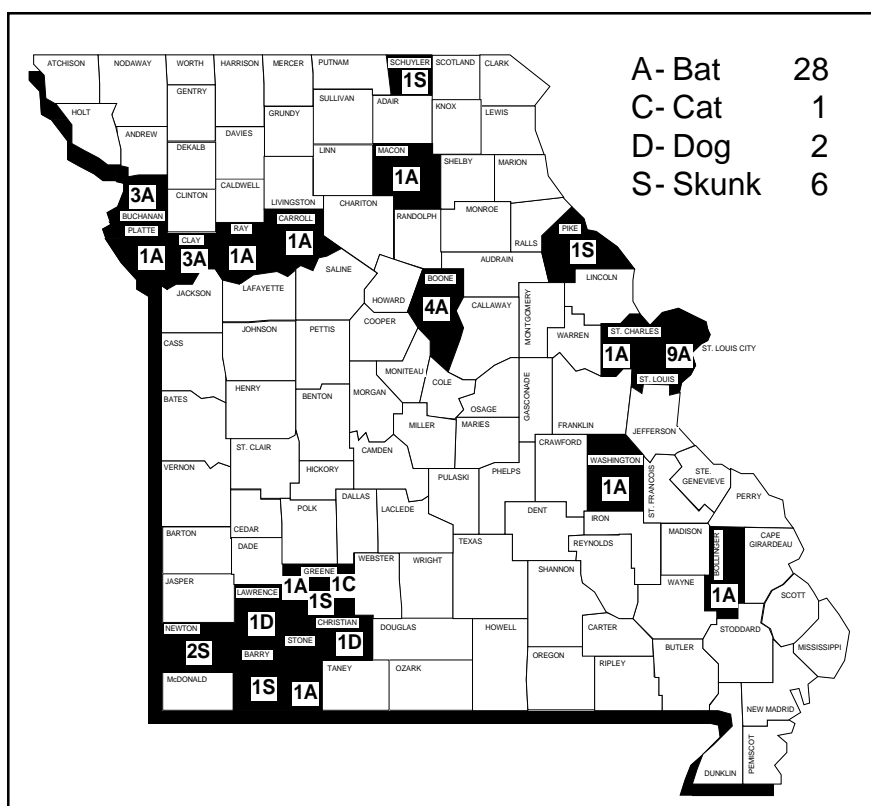


Figure 1. Rabies cases, Missouri, 1992.

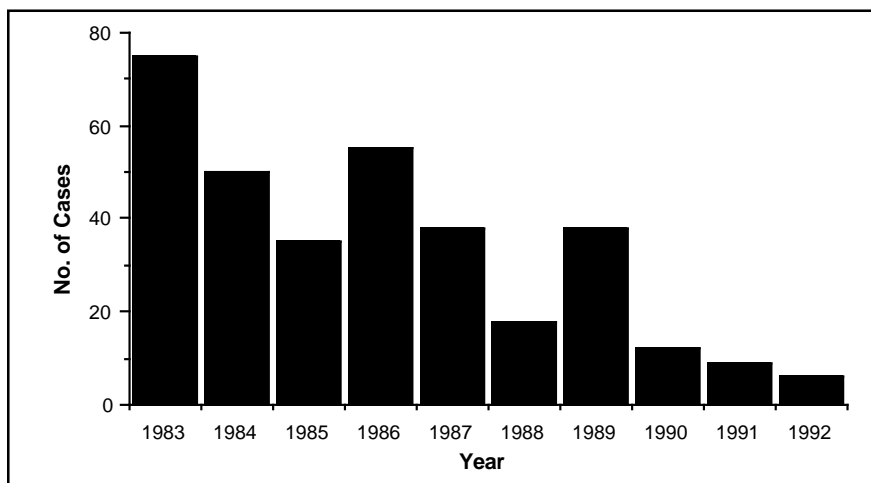


Figure 2. Rabies cases in skunks by year, Missouri, 1983-92.

over into other wild and domestic species. Therefore, rabies was not detected in any other wildlife species and only three domestic animals.

Illinois is experiencing this same phenomenon, having 40 total rabies cases in 1992; 27 were bat cases and only nine were in skunks. The number of skunks tested in Missouri in 1992 was 117, with only six positive, for a positive rate of

5.1 percent. Bat rabies accounted for 67.5 percent of the total rabies in Illinois. Missouri's 28 bat cases accounted for 76 percent of Missouri's rabies cases. Missouri's positive rate for bats was 8.9 percent. As a general rule, the percent of total positive in the main reservoir of rabies (skunks) goes up one year before the total number of rabies cases in the state increases. The incidence of rabies in bats does not parallel the incidence of

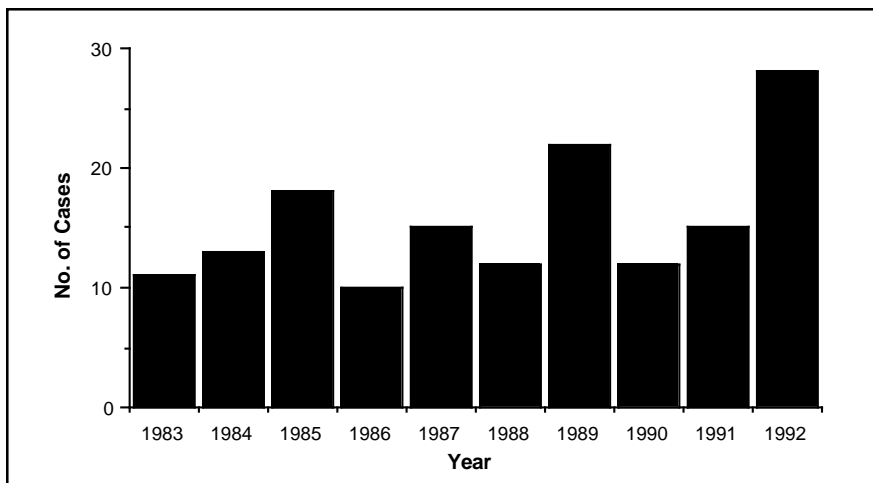


Figure 3. Rabies cases in bats by year, Missouri, 1983-92.

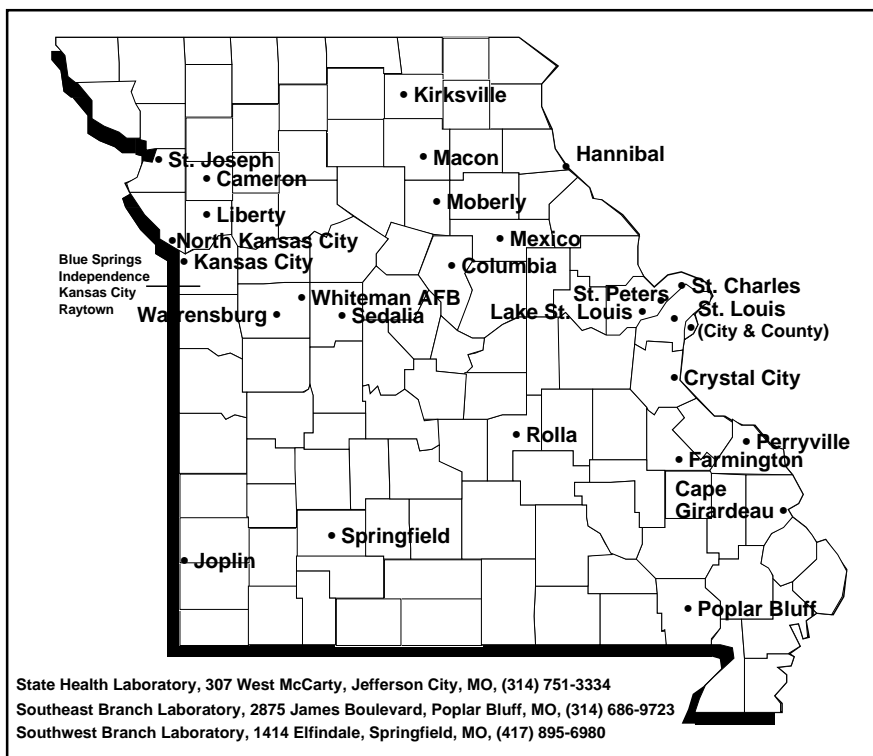


Figure 4. Department of Health lab courier service stops.

rabies in domestic animals. Most human rabies cases have historically resulted from exposure to rabid domestic animals.

Figure 4 depicts laboratory courier pick up points in Missouri. The addition of this service should promote a more effective rabies surveillance system. For additional information about courier stops in your area, contact your local health department.

The Missouri Department of Health is reiterating its rabies submission policy to exclude the examination of rodents (rats, mice, gerbils, guinea pigs, hamster, etc.). There has not been a documented case of rabies in a rodent in Missouri for as long as records have been kept. Continued testing of these specimens, without justification, is not indicated and is a misuse of laboratory effort.

This policy will go into effect November 15, 1993. After November 15, consultation with, and approval from the Bureau of Veterinary Public Health will be required before submitting a rodent specimen for rabies testing. **For further information please call the Bureau of Veterinary Public Health at (314) 751-6136.**

National Rabies Picture

Preliminary data for 1992 show that animal rabies in the United States increased from 6,975 cases in 1991 to approximately 8,372 cases in 1992, an increase of 1,397 cases or approximately 20 percent. Wildlife rabies accounts for 92 percent of all rabies, with only eight percent of all rabies occurring in domestic animals.

Epizootics of raccoon rabies are occurring in Georgia and the mid-Atlantic states. Raccoon rabies, which represents 48.4 percent of wildlife rabies nationally, has increased from 1,821 cases in 1990 to 3,079 cases in 1991 and to over 4,000 cases in 1992. Connecticut, Delaware, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Virginia, Washington, D.C. and West Virginia reported 87 percent of the raccoon rabies in 1991. This raccoon epizootic continues to move in all directions from its original epicenter in West Virginia. Movement to the north and east have been more rapid than movement to the south or west. Raccoon rabies has moved west into the state of Ohio.

Epizootics of skunk rabies are occurring in New York as a result of an epizootic of red fox rabies. Skunk epizootics are also occurring in California, Minnesota, Texas, South Dakota, Oklahoma and Kansas. Skunk rabies accounted for approximately 30 percent of all wildlife rabies nationally.

Bat rabies accounts for ten percent of all wildlife rabies. It occurred in 47 of the 48 contiguous states in 1991. Fox rabies accounted for only 4.6 percent of wild-

(continued on page 22)

(continued from page 21)

life rabies nationally. Other wildlife species affected by rabies in 1991 were 54 mongooses, 55 groundhogs, 50 coyotes, eight deer, six bobcats, six opossums, three beavers, two bears, two otters, two rabbits, two wolves, one badger, one nutria, one porcupine and one squirrel.

Domestic animal rabies (618 cases in 1991) was only eight percent of the total rabies cases nationally. Texas, with 80 cases, had the most cases of domestic rabies. Cattle had the highest incidence of domestic rabies with 217 cases. Minnesota (42 cases), Iowa (39 cases), South Dakota (36 cases) and Texas (15 cases) had the highest number of rabid cattle in 1991.

In recent years, dogs and cats each had 150–200 cases of rabies per year. In 1991, there were 155 rabid dogs and 189 rabid cats. Texas had the most rabid dogs with 36 cases, related to the epizootic in coyotes. New Jersey with 32 cases, had the most rabid cats related to the epizootic in raccoons. Other domestic animals with rabies in 1991 were 44 equine, six goats, four sheep, two llamas and one pig.

Nationally, there were three cases of human rabies in 1991 and one in 1992. Of the three human rabies cases in 1991, two (one in Georgia and one in Arkansas) resulted from exposure to rabid bats. During the period from 1981 through 1992, 16 cases of human rabies occurred, five of the 16 resulted from exposure to rabid bats. While bats have historically not been important in transmitting rabies to domestic animals or humans, the latest human cases prove it can happen. Bats like skunks, raccoons, foxes and all other wild animals play an important part in the ecology and environment of this earth. They accomplish this best when man allows them to adapt and adjust to nature as cyclic ecological changes occur.

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	May 93	Jun 93	Total YTD
Specimens Tested	9,131	10,848	57,849
Initial (percent)	66.1%	66.7%	38,772
Repeat (percent)	33.9%	33.3%	19,077
Specimens: Unsatisfactory	95	133	599
HT Borderline	728	833	3,736
HT Presumptive	24	33	136
PKU Borderline	19	13	107
PKU Presumptive Positive	0	1	4
GAL Borderline	22	48	131
GAL Presumptive Positive	6	4	23
FAS (Sickle cell trait)	101	88	565
FAC (Hb C trait)	22	31	176
FAX (Hb variant)	5	15	78
FS (Sickle cell disease)	3	0	14
FSC (Sickle C disease)	1	1	12
FC (Hb C disease)	0	0	0
	Jul 93	Aug 93	Total YTD
Specimens Tested	10,120	10,504	78,473
Initial (percent)	66.9%	67.4%	52,624
Repeat (percent)	33.1%	32.6%	25,849
Specimens: Unsatisfactory	122	112	833
HT Borderline	973	991	5,700
HT Presumptive	28	26	190
PKU Borderline	17	22	146
PKU Presumptive Positive	2	2	8
GAL Borderline	70	68	269
GAL Presumptive Positive	6	2	31
FAS (Sickle cell trait)	106	99	770
FAC (Hb C trait)	16	33	225
FAX (Hb variant)	16	13	107
FS (Sickle cell disease)	2	3	19
FSC (Sickle C disease)	3	1	16
FC (Hb C disease)	0	0	0

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Elevated Nitrate Levels in Missouri's Private Wells

Randall Maley

Bureau of Environmental Epidemiology

Elevated nitrate levels continue to be a problem in Missouri's private wells. In some counties, more than half the water samples collected in 1991 and 1992 exceeded the public drinking water standard of ten parts per million. Nitrates are a health concern because of their ability to cause methemoglobinemia, commonly known as blue-baby disease, a potentially fatal illness in infants.

In Missouri, high nitrate levels are usually the result of human or animal waste leaking into shallow wells. Liquid nitrate fertilizer is less commonly implicated. Likewise, wells over 100 feet in depth are much less likely to contain high nitrate levels.

As can be seen in Figure 1, nitrates tend to be a regional problem in the state. Northern Missouri tends to have higher nitrate levels because of the type and extent of agriculture, soil types and the abundance of shallow wells. The map also shows a difference in percentages between northwest and northeast Missouri. This is a trend that we believe is due to the recent increase in the availability of public water. Public water systems are expanding, primarily because of the Clarence Cannon Wholesale Water District, which is supplying water from Mark Twain Lake to parts of seven counties. The availability of public water has, in turn, caused marginal private wells to be taken out of service.

Infant morbidity and mortality from methemoglobinemia is much less common than a generation ago. Part of the reason is cultural, i.e. more breast-feeding and the popularity of ready-to-feed formula. Much of the credit, however, is due to health care providers in both the public and private sectors. Public health nurses, for example, routinely require that well water be analyzed for nitrates before giving powdered formula to WIC clients.

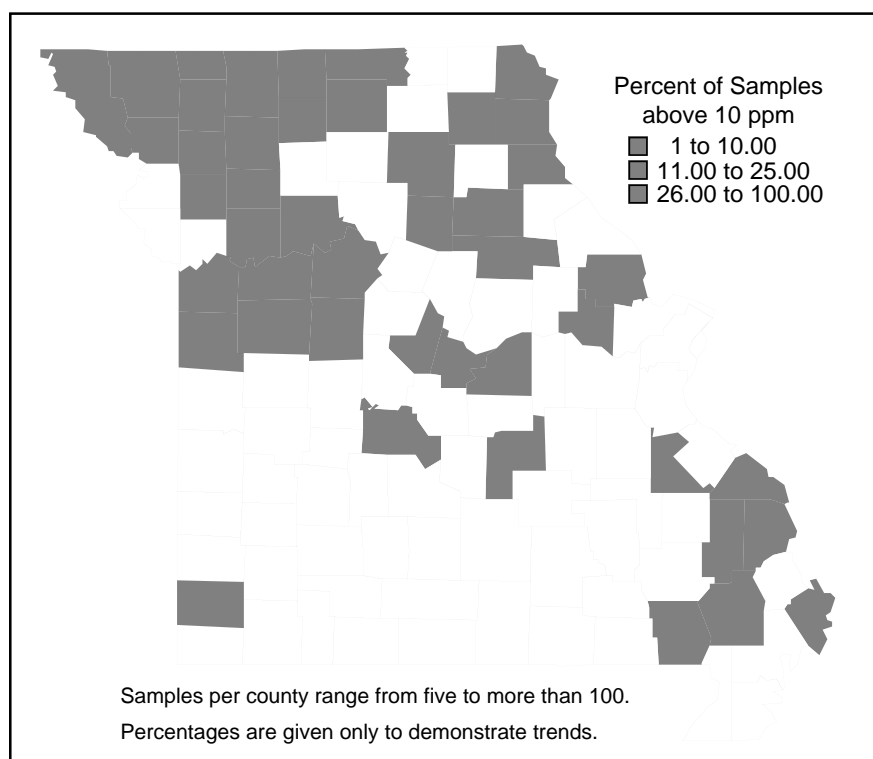


Figure 1. Nitrate samples above the public drinking water standard, Missouri, 1991-92

EPA Regulations

(continued from page 12)

those areas which are under a restricted entry interval. (A restricted entry interval is the period of time after a pesticide application that workers may not enter a treated area.)

The regulations also require that pesticide labels specify what personal protection equipment, and which restricted entry interval, must be used with each pesticide. An additional requirement is that under certain conditions, treated areas must be posted.

Medical care providers may wish to inform injured persons that there are regulations regarding the safe use of pesticides.

In Missouri, the WPS will be administered by the Bureau of Pesticide Control of the Missouri Department of Agriculture.

For further information about WPS or other pesticide regulatory issues, please contact:

**Missouri Department of
Agriculture
Bureau of Pesticide Control
P.O. Box 630
Jefferson City, Missouri 65201
(314) 751-2462**

Hearing impaired Missourians may contact the department through Relay Missouri at:

**(800) 735-2966
(TT/TDD)**

Syphilis Epidemic Sweeps St. Louis Metropolitan Area

Carol Friedman, D.O.

Centers for Disease Control and Prevention

The St. Louis metropolitan area is experiencing a syphilis epidemic. Cases of primary and secondary syphilis have increased by more than 600 percent in the past two years. In 1990, 97 cases of primary and secondary syphilis were reported in both St. Louis City and County while in 1992, 741 cases were reported. As of September 18, 1993, over 800 cases of primary and secondary syphilis have been reported. See Figure 1. The majority of these cases have been among heterosexual, African-American men and women. The 1992 race-specific rates were 315/100,000 population in African-Americans and 3/100,000 in whites.

Congenital syphilis increased by almost 200 percent in 1992 with 13 cases confirmed. Forty-six new cases and one death have been reported as of September 1993. See Figure 2. If cases continue to be reported at this rate, congenital syphilis cases may double by the end of 1993.

A task force consisting of public health officials from St. Louis City and County, the Missouri Department of Health, the Illinois Department of Health and the Centers for Disease Control and Prevention has been formed to address the syphilis problem in the St. Louis metropolitan area. The purpose of the task force is to:

- Coordinate and intensify efforts to combat the epidemic.
- Develop new intervention strategies.
- Facilitate access to primary care services.
- Educate the public.
- Raise the level of interest of the medical community.
- Involve the community.

There is much that health care providers can do in response to the epidemic. It is important that the level of suspicion

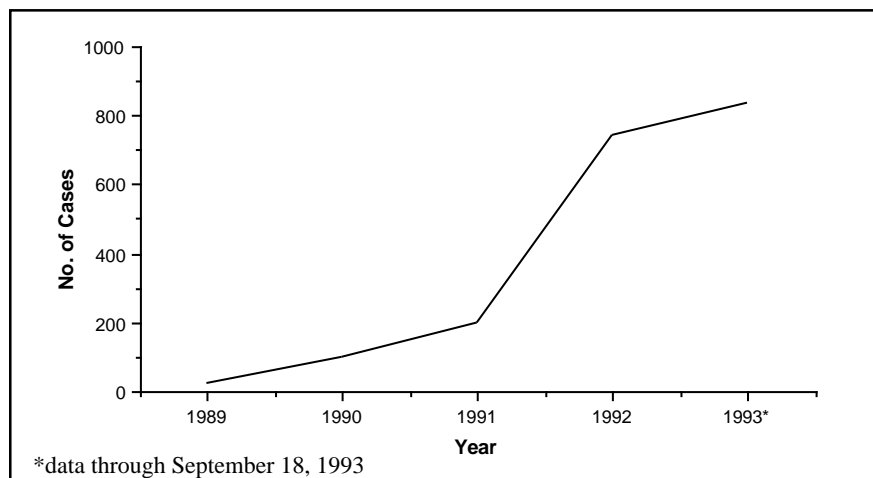


Figure 1. Primary and secondary syphilis cases by year of report, St. Louis City and County, Missouri, 1989-93.

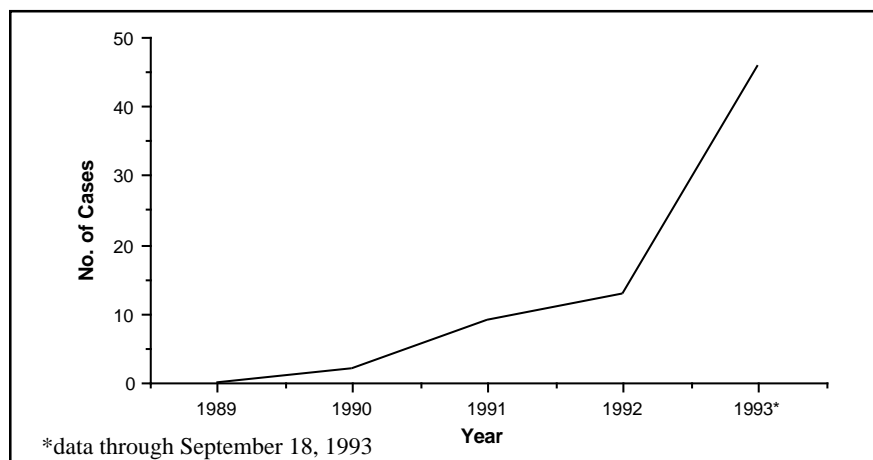


Figure 2. Congenital syphilis cases by year of report, St. Louis City and County, Missouri, 1989-93.

regarding syphilis be increased in both the private and public medical communities. The Sexually Transmitted Disease (STD) programs of the St. Louis City and County Health Departments, the Missouri Department of Health and the Centers for Disease Control and Prevention recommend that all physicians administer a VDRL or RPR to screen for syphilis among the following high-risk groups:

- Any patient who presents with a genital lesion, or with a suspicious body rash (particularly in the palmar or planter area).
- All women of child-bearing age. (Pregnant women should be screened sev-

eral times—at the first visit [preferably first trimester], the third trimester and the time of delivery. A cord blood sample should also be drawn and held pending maternal status).

- All teens who are sexually active (aged 12-19 years)
- All men and women with two or more sex partners in six months
- All persons who use illicit drugs such as cocaine, marijuana and heroin
- All persons who have had sexual contact with prostitutes
- All persons with a history of exchanging sex for money or drugs
- All patients with other STDs or who are HIV positive

An RPR or VDRL should be performed every three months on patients with two or more sexual partners in six months. Any reactive results should be confirmed with either an FTA-ABS or MHA-TP. In addition, all syphilis patients should be tested for HIV.

Patients who have syphilis and who are HIV-positive need to be evaluated for neurosyphilis and other late stages of the disease. Vigorous, prolonged intravenous and/or intramuscular penicillin therapy is usually warranted. Consultation for patient management is available by calling one of the numbers listed below.

Physicians are urged to maintain a high level of suspicion for syphilis and screen and treat accordingly among the aforementioned high-risk groups. The recommended treatment guidelines for syphilis can be found on the back cover of this issue.

Educational efforts have been directed at increasing the public's awareness of the signs and symptoms of syphilis and reducing risky behaviors.

It is through aggressive screening for syphilis, proper treatment of patients with reactive serologies, prompt reporting of all positive cases and patient education that the medical community can help bring an end to this epidemic.

URGENT

In the St. Louis metropolitan area, physicians should report each syphilis diagnosis and laboratories should report all positive syphilis tests immediately by phone or FAX to one of the following:

St. Louis City Division of Health
(314) 658-1025
(314) 658-1017 FAX

St. Louis County Health Department
(314) 522-6410
(314) 854-6435 FAX

Missouri Department of Health
(314) 751-6139
(314) 751-6447 FAX

Environmental and Occupational Diseases and Findings Reportable

Randall Maley
Bureau of Environmental Epidemiology

The object of public health is to prevent disease and to promote health. Lofty definitions of health include not merely the absence of disease, but also maximizing the quality of life. Without specific goals and objectives, however, it is impossible to measure progress toward the ideal. Only by analyzing pertinent data on populations can providers and policy makers make the decisions necessary to optimize health care resources.

Problems occur when the data needed to make decisions are not available. Imagine trying to prioritize finite resources to prevent illness without any data on the incidence or prevalence of disease.

In order to fulfill its mission, the Department of Health is taking numerous steps to increase and improve data collection. Only by determining a baseline level and setting goals can the effectiveness of programs be measured.* Toward this end, the Department of Health requires reporting of certain diseases, conditions and findings. Included in these "reportable diseases" are several which are environmental or occupational in nature.

The Department of Health rule requiring disease reporting is 19 CSR 20-20.020. This rule was recently amended expanding the number and type of health conditions that should be reported. This amendment went into effective April 8, 1993.

19 CSR 20-20.020 lists several disease categories which must be reported to the Department of Health or local health department. Diseases which are required to be reported within 24 hours of suspected or established diagnosis should be reported by telephone, telegraph, FAX or other rapid communication. Verbal reports should be followed by "hard copy" within seven days. Five categories

of reportable diseases are defined. Environmental or occupational diseases which are reportable include two categories:

Category III diseases are to be reported to the Department of Health or local health agency within 24 hours of diagnosis. These include:

Acute chemical poisoning
(as defined in 56 FR 52166-75)
Carbon monoxide poisoning
Hyperthermia
Hypothermia
Methemoglobinemia
Pesticide Poisoning

Category IV diseases are to be reported within seven days of diagnosis. These include:

Blood lead $\geq 10\mu\text{g/dl}$
(in persons <18 years of age)
Blood lead $\geq 25\mu\text{g/dl}$
(in persons ≥ 18 years of age)
Silicosis
Asbestosis
Byssinosis
Farmer's lung
Toxic organic dust syndrome
Heavy metal poisoning
(including arsenic, cadmium and mercury)
Respiratory diseases triggered by environmental factors such as occupationally-induced asthma and bronchitis

Reports should include person's name, address, age, sex, race, name of disease, condition or finding diagnosed or suspected, the date of onset of the illness and whether the patient is hospitalized. If the patient is hospitalized, the name and address of the hospital, date of report, the name and address of the attending physician and any appropriate laboratory results must be included in the report.

*For a more detailed discussion and specific goals and objectives, see "Healthy Missourians 2000".

Sexually Transmitted Diseases - 1992

Bill Huber

Bureau of Sexually Transmitted Diseases

The Bureau of Sexually Transmitted Diseases provides assistance to local health departments for the control of sexually transmitted diseases in their communities. Guidelines for testing, diagnosis and treatment are developed and distributed as recommended by the Centers for Disease Control and Prevention. Screening materials and medications for treatment are provided to local health departments, and bureau personnel are available to assist with partner notification and follow-up services. The bureau also provides morbidity trend analysis and other program evaluation services.

Early Syphilis

Primary, Secondary and Early Latent (of less than one year's duration)

The reported incidence of early syphilis increased significantly in calendar year (CY) 1992 compared to CY 1991. Primary and secondary cases increased by 104 percent from 572 in 1991 to 1,167 in 1992. Early latent cases increased by 151 percent from 247 in 1991 to 620 in 1992. St. Louis City reported almost half of the early syphilis cases in Missouri; 608 primary and secondary cases and 244 early latent cases. In addition, a significant outbreak of early syphilis occurred in the "Bootheel" region of southeastern Missouri during CY 1992. Nearly 200 cases of early syphilis were identified in seven rural counties from this area, for a rate of 100 cases per 100,000 population. See related article on pages 24 and 25 of this issue.

The majority of syphilis cases in all areas of the state continues to appear related to crack-cocaine use. Usage of this drug also appears to be related to increases in other sexually transmitted diseases.

The primary and secondary syphilis rate of 22.8 per 100,000 population in Mis-

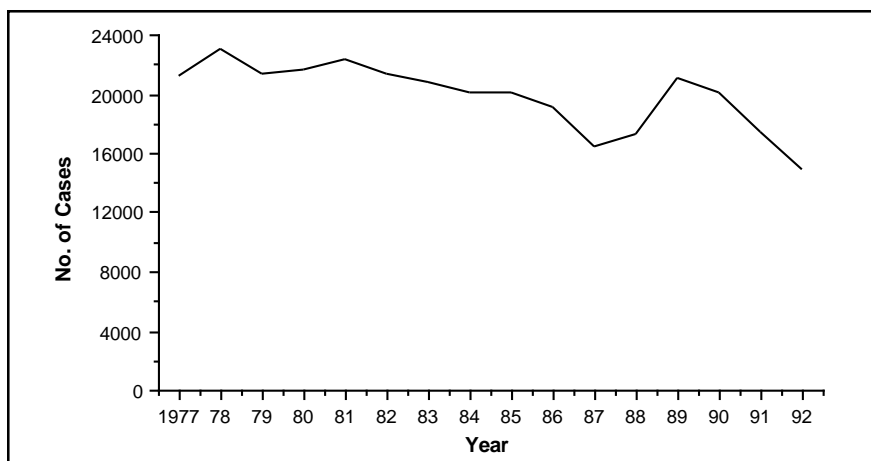


Figure 1. Gonorrhea cases by year of report, Missouri, 1977-93.

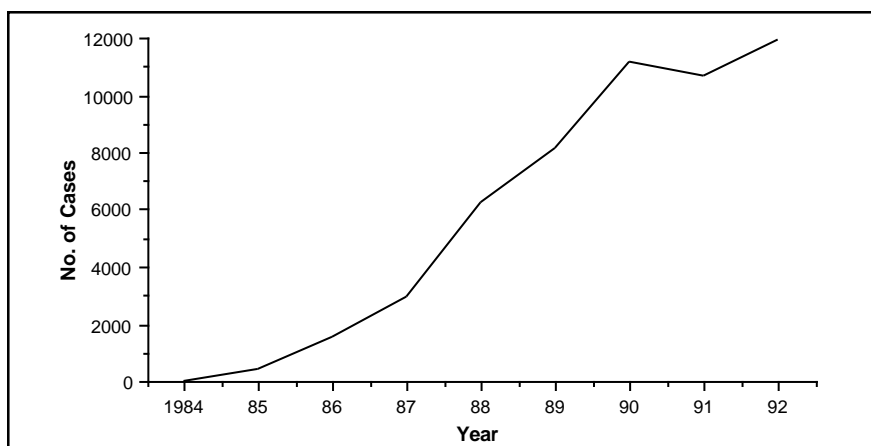


Figure 2. *Chlamydia trachomatis* infections by year of report, Missouri, 1984-93.

souri during 1992 is significantly higher than the corresponding national rate of 13.8 per 100,000 population.

Gonorrhea

The reported incidence of gonorrhea in Missouri decreased by 14.6 percent from 17,450 cases in CY 1991 to 14,887 in CY 1992. This corresponds to a decrease in the rate from 338.3 per 100,000 in 1991 to 286.6 per 100,000 in 1992. St. Louis City reported a decrease in gonorrhea incidence of 25.2 percent. St. Louis County, Kansas City and Outstate Missouri also reported decreases of 10.8, 1.4 and 4.8 percent respectively. This is the third consecutive year in which such decreases in gonorrhea have been reported. See Figure 1. This trend reflected in the reported data appears to be real

and is supported by a decrease in the positivity observed in the gonorrhea screening project, even though a reduction in the level of screening has resulted in a realignment of screening to the highest risk populations.

Penicillinase-producing *N. gonorrhoeae* (PPNG)

All gonorrhea in Missouri is considered to be resistant to penicillin and tetracycline-based medications.

Gonococcal Pelvic Inflammatory Disease (GPID)

GPID cases decreased from 384 reported in CY 1991 to 308 reported in CY 1992. St. Louis City and County reported a decrease from 226 cases in 1991 to 178

cases in 1992. Kansas City also reported a decrease from 77 cases in 1991 to 40 cases in 1992. Outstate Missouri reported a slight increase from 81 cases in 1991 to 90 cases in 1992.

Non-Gonococcal Urethritis (NGU)

Reported cases of NGU decreased 24 percent from 9,068 in 1991 to 6,874 in 1992. This decrease was seen in all areas of the state with the exception of Outstate Missouri, and it occurred following increases in reported cases during each of the three preceding years.

Chlamydia Trachomatis Infections

Reported *Chlamydia trachomatis* infections increased 12 percent from 10,643 cases in CY 1991 to 11,907 cases in CY 1992. This increase is consistent with previous increases in the annual number of reported cases which have occurred since *C. trachomatis* infections were designated a reportable condition in March 1986. See Figure 2. Widespread therapy of symptomatic patients without testing, plus dual treatment of all gonorrhea cases (gonorrhea therapy plus chlamydia therapy), have contributed to under-reported morbidity. Positivity in the screening program has decreased from 16 percent positivity five years ago to 10 percent last year.

Genital Herpes

Genital herpes increased 13.5 percent, with 3,244 cases reported in CY 1991 and 3,681 cases reported in CY 1992. All areas of the state reported increases in cases reported.

Congenital Syphilis

Congenital syphilis increased from 14 cases reported in CY 1991 to 28 cases reported in CY 1992. This trend is expected to continue over the next few years due to the increases of early syphilis reported among females, and also to the revised and expanded surveillance criteria for congenital syphilis. The expanded criteria, which went into effect July 1, 1990, are outlined on this page.

Congenital Syphilis Surveillance Case Definition (effective July 1, 1990)

For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis in infants and children, as well as syphilitic stillbirths.

A **confirmed case** of congenital syphilis is:

An infant in whom *Treponema pallidum* is identified by darkfield microscopy, fluorescent antibody, or other specific strains in specimens from lesions, placenta, umbilical cord, or autopsy material.

A **presumptive case** of congenital syphilis is either of the following:

- A. Any infant whose mother had untreated or inadequately treated¹ syphilis at delivery, regardless of findings in the infant;

OR

- B. Any infant or child who has a reactive treponemal test for syphilis and any one of the following:

- a. Any evidence of congenital syphilis on physical examination²;

or

- b. Any evidence of congenital syphilis on long bone x-ray;

or

- c. Reactive cerebrospinal fluid (CSF) VDRL³;

or

- d. Elevated CSF cell count or protein (without other cause)³;

or

- e. Quantitative nontreponemal serologic titers which are four-fold higher than the mother's (both drawn at birth);

or

- f. Reactive test for FTA-ABS-19S-IgM antibody³.

A **syphilitic stillbirth** is defined as:

A fetal death in which the mother had untreated or inadequately treated¹ syphilis at delivery of a fetus after a 20-week gestation or of >500 grams.

¹ Inadequate treatment consists of any non-penicillin therapy given less than 30 days prior to delivery.

² Signs in an infant (<2 years) may include hepatosplenomegaly, characteristic skin rash, condyloma lata, snuffles, jaundice (syphilitic hepatitis), pseudoparalysis, or edema (nephrotic syndrome). Stigmata in an older child may include: interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson's teeth, saddle nose, rhagades, or Clutton's joints.

³ It may be difficult to distinguish between congenital and acquired syphilis in a seropositive child after infancy. Signs may not be obvious and stigmata may not yet have developed. Abnormal values for CSF VDRL, cell count, and protein, as well as IgM antibodies, may be found in either congenital or acquired syphilis. The decision may ultimately be based on maternal history and clinical judgment; the possibility of sexual abuse also needs to be considered.

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The Managing Editor is H. Denny Donnell, Jr., MD, MPH, State Epidemiologist, assisted by an Editorial Board including Bill Schmidt, MPH, Director, and Hilda Chaski, MPH, Deputy Director of the Division of Environmental Health and Epidemiology. Diane Rackers is the Production Manager. Questions or comments should be directed to (314) 751-6128 or toll free (800) 392-0272.

If you desire a copy of this publication in alternate form because of a disability, contact the Missouri Department of Health, Division of Administration, P.O. Box 570, Jefferson City, MO 65102 at (314) 751-6035. Hearing-impaired citizens may contact the department by phone through Missouri Relay at (800) 735-2966.

This newsletter can be recycled.



Centers for Disease Control and Prevention 1993 Treatment Guidelines for Syphilis

Recommended regimen for primary and secondary syphilis:

Nonallergic adult patients—Benzathine penicillin G, 2.4 million units IM, in one dose.

Penicillin-allergic patients—Doxycycline, 100 mg orally twice a day for 14 days **or**
Tetracycline, 500 mg orally four times a day for 14 days.

Penicillin-allergic patients who cannot tolerate doxycycline or tetracycline—Erythromycin, 500 mg orally four times a day for 14 days.

Recommended treatment regimen during pregnancy:

Primary and secondary syphilis—Benzathine penicillin G, 2.4 million units IM, in one dose.

Some experts recommend additional therapy, such as second dose of benzathine penicillin 2.4 million units IM, one week after initial dose, especially for those in third trimester of pregnancy, and for women with secondary syphilis during pregnancy.

Tetracycline and doxycycline are contraindicated.

Erythromycin should not be used because it cannot be relied upon to cure an infected fetus.

Penicillin-allergic pregnant women should be treated with penicillin after desensitization.

See related article on pages 23–24 regarding syphilis outbreak in the St. Louis metropolitan area.